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DIAGNOSIS OF PULMONARY LESIONS*

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The diagnosis of pulmonary lesions is relatively easy because of the definite graphic methods involved. As in the case of all ailments, we should try to make the diagnosis of lung disease as early as possible—that is, before symptoms occur. The simplest way to accomplish this is to do routine examinations of the chest by x-ray methods. This means a routine chest film on anyone consulting a physician for the first time, at initial visits to hospital clinics, admission to hospitals, on employment, mass surveys, etc. These should be repeated at least annually—in the case of males over 40 who smoke, semiannually.

Figure 1

The following illustrations show lesions discovered in apparently healthly individuals. They were taken simply as a routine measure. Fig 1 shows an active tuberculous lesion in a girl of 20. Fig. 2 shows a

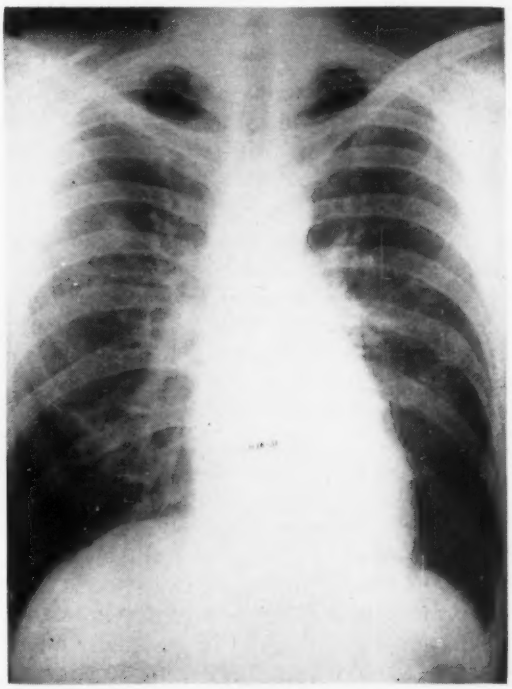

Figure 2

*Presented at the Seventy-third Annual Meeting of the Louisiana State Medical Society in New Orleans, May 9, 1953.

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bronchogenic carcinoma in a man of 42 who was an excessive cigarete smoker. Fig. 3 shows far-advanced tuberculosis in a man of 72.

Figure 3

The main symptoms relative to lung diseases are: cough, sputum, hemoptysis, and chest pain. If any of these occur in the interval between routine films, another chest film must be taken.

In Fig. 4, you see the film of a 30 year old male who developed only a feverish feeling and a slight nonproductive cough about two hours before the film was taken. Chest examination was negative. Film shows an area of pneumonia in the right lung which promptly responded to an antibiotic.

If most lung diseases are found early enough, there will be no physical findings in the chest. Only gross disease will produce them. It is perhaps more important to do a complete examination of the body other than the chest. In Fig. 5, you see the film of a young man taken as a routine measure and showing a density in the right lung. As you would expect, the chest examination was negative. However, a careful complete

Figure 4

Figure 5

physical examination revealed a small malignant tumor of the right testicle, of which the patient himself was unaware.

The laboratory may help. A routine blood examination may show abnormal cells in the smear, which may lead to a clinically silent lymphosarcoma to explain a density in the chest film. The urine may show abnormalities which may indicate a renal tumor. In one case a puzzling lung lesion was made definite by a bone marrow aspiration, which showed the presence of abnormal plasma cells—plasmacytoma.

We hope to find most lung disease before the production of sputum occurs. If it is present, it should be thoroughly examined, if it is to be examined at all. Smears must be stained by more than one technique and examined for more than one thing. All types of organisms must be sought. All types of cells must be considered. All types of organisms must be kept in mind in culturing the material—common pathogens, tuberculosis bacilli, and fungi: To pay attention to only one thing may be fatal for your patient. Regard Fig. 6, the chest film of

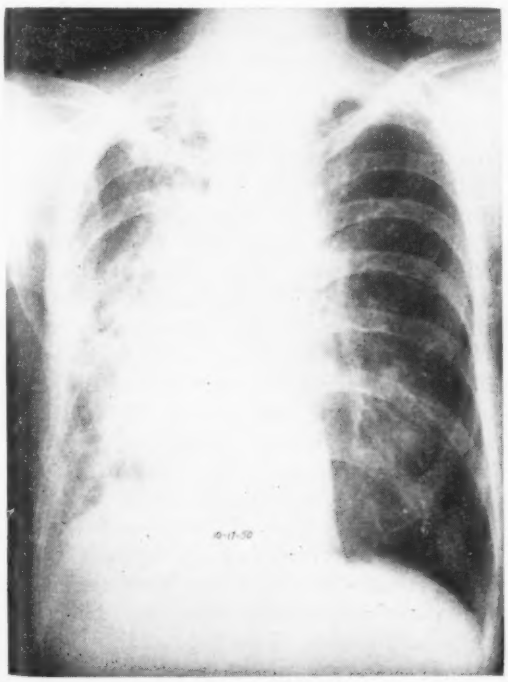

Figure 6

an older man, who had sputum positive on direct smear for acid-fast organisms. His clinical picture, chest film and sputum smear all indicated unequivocal diagnosis of pulmonary tuberculosis. However, look at Fig. 7, the routine cytologic smear. Malig-

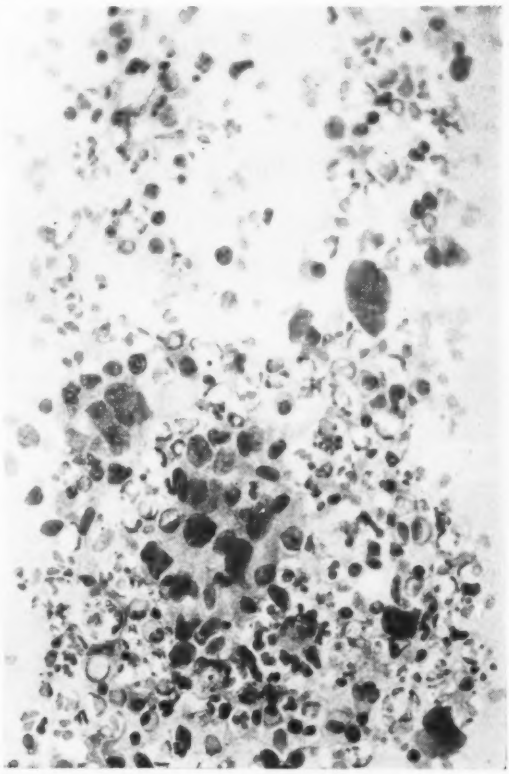

Figure 7

nant cells are seen. On autopsy he was found to have both active cavernous tuberculosis and an inoperable bronchogeic cancer. In Fig. 8, you see the film of a 44 year old man with a lesion which was clinically apparently definitely an acute pneumococcal pneumonia. Sputum cultures showed large numbers of these organisms. Concomitant with the administration of aureomycin the lesion rapidly and completely cleared—Fig. 9. However, a routine tuberculosis culture was reported positive for tubercle bacilli a month after he had left the hospital. By searching the local taverns he was finally found and a chest film showed (Fig. 10) a new lesion, which on

Figure 8

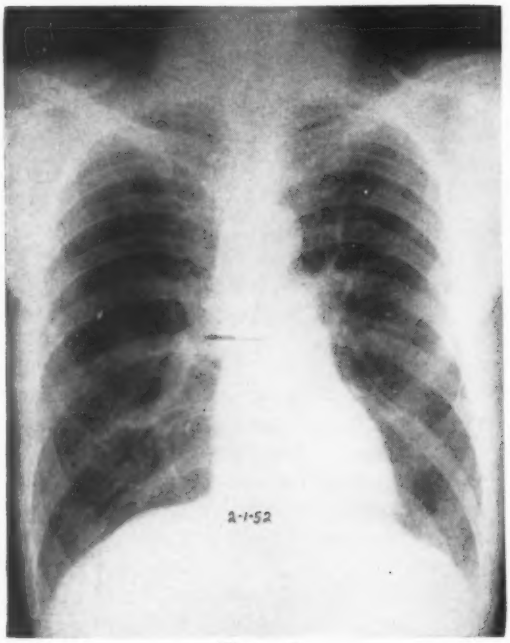

Figure 9

further study proved to be definitely tuberculous.

Now we come to the x-ray examination. This is by far the most important single available diagnostic tool. Here is a machine which can find disease in the lung long before clinical (and you recall that clinical means "bed-side") methods can reveal it. I must admit, though, that some degree of either artful science or scientific art on the part of the doctor is necessary for extracting the meaning of the findings. We do not yet have a medical Mark IV. If you will look at Fig. 11, you will see the film of a 52 year old man, whose main complaint was a low backache. He also had a "cigarette cough," which had not changed for years. In addition he had moderate angina pectoris and some dyspnea on exertion. The film was taken as a routine matter and shows no changes other than those related to the cardiovascular system. Yet at this very moment he had a tiny bronchogenic carcinoma no bigger than a pea in his left main bronchus, which had already metastasized to his mediastinal lymph nodes, liver, adrenals and bones, as an autopsy some days later showed. He died from a massive intestinal hemorrhage from an ulcerated metastatic lesion. This type of thing, however, is extremely rare. In general, one can say that the examination of the chest is in-

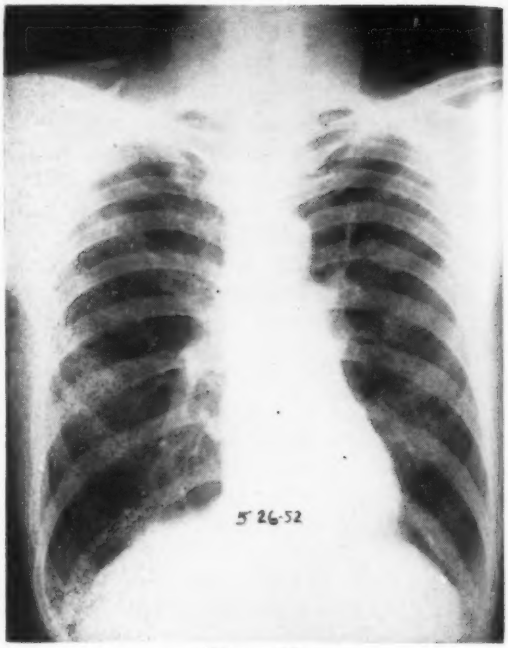

Figure 10

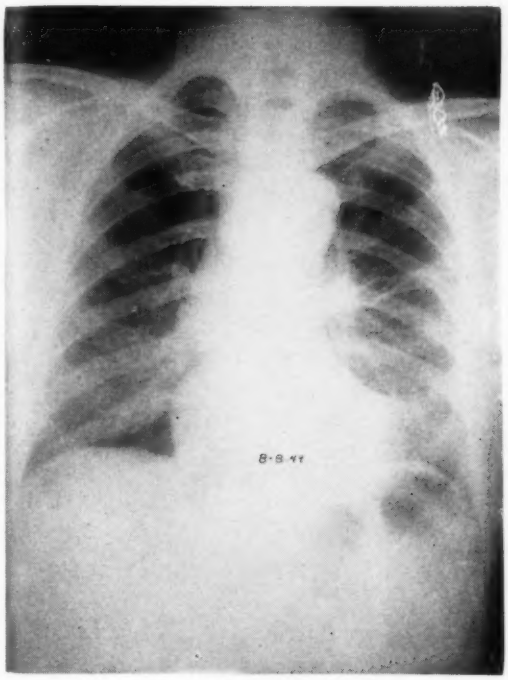

Figure 11

complete without an x-ray film. If you use a photo-fluorographic apparatus with the 5 by 4 film, you can get a picture which compares well with the usual 14 by 17 film and is much cheaper, quicker, and easier to do. Fluoroscopy in the hands of a man well trained and experienced in its use is a possible substitute, but will miss the small early lesions we wish to find.

In considering the x-ray examination we should not forget regions of the body other than the lungs. A bronchogenic carcinoma can be either solitary or diffuse and either localized in the chest or metastatic to other regions. So also a neoplasm primary elsewhere in the body may metastasize to the lungs and there appear either as a solitary density or diffuse shadow. Thus the bones, gastrointestinal tract, and kidneys must usually be examined in addition to the chest. It is rather difficult for the patient to have a lung, or part of it, removed, only to find out that it is a metastatic tumor from the kidney.

This brings up a point. The doctor no longer can salve his conscience by saying that facilities are not available for taking chest films. The profession owes it to the public to make necessary services available by one means or another. Private donations or community or state funds can usually be interested in matters genuinely affecting the public's health. It is not inconceivable that medical society funds might be justly invested in such a project on a non-profit basis. Remember this: if we don't, that old ogre we are afraid of will.

No density on a chest film is diagnostic of any particular disease. The same shadow may represent tuberculosis, pneumonia, cancer, or fungus disease. Special types of films may help. A lateral film may add a good deal to the usual PA view. Oblique films will sometimes show an otherwise invisible shadow behind the heart or the domes of the diaphragm. Use of the Potter-Bucky technique may help. Tomographs and arteriographs sometimes are necessary to help clarify a lesion. Bronchograms are useful usually only when bronchiectasis is in question. If this is the case there are usually chronic symptoms. Unless this disease is seriously suspected, it is best to avoid bronchography. It adds little to the array of evidence and only obscures the chest film with opaque oil droplets.

Another diagnostic aid is the bronchoscope. If it shows a lesion which may be directly biopsied, a definite diagnosis may be made. If not, sometimes the material aspirated through the instrument may give a clue. This material is examined in exactly the same manner as sputum. Our own experience has been better with the bronchial aspirate than with the sputum in the case of malignant cells. Keep this well in mind: *a negative bronchoscopic examination does not rule out a cancer or any other lesion.*

Occasionally you will see pleural fluid accompanying a lung lesion. In some of these instances all will be negative up to the point of the fluid. If some of this is aspirated and carefully studied, a clue to the diagnosis may be found. As in the case of the sputum, the fluid should be *completely* examined. Fig. 12 shows a smear of the sediment of

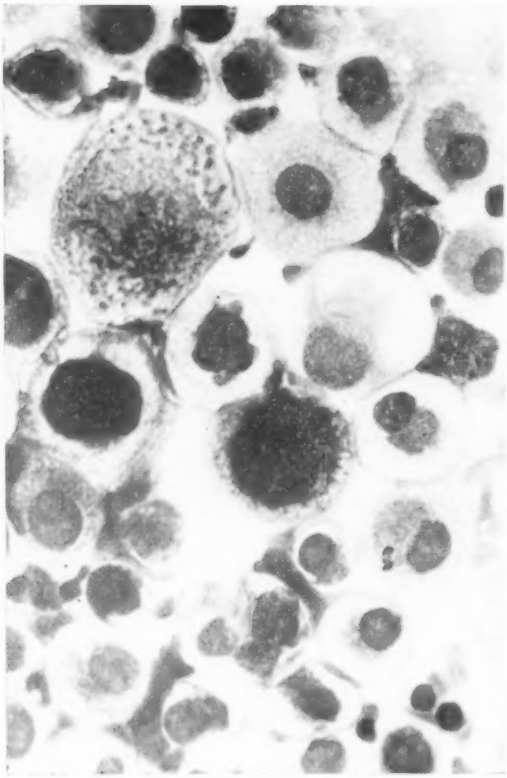

Figure 12

a fluid from a middle-aged man in whom all other studies were negative. It shows myriads of malignant cells, later proven to be from a bronchogenic carcinoma.

Sometimes an enlarged lymph node can be found in the cervical or axillary group. If all else fails to help, an aspiration or biopsy of this may be valuable. Once again the examination should be complete. If biopsy is done, part of the fresh node should be sent for bacteriological study before the remainder is popped into formaldehyde. By this method a patient with a diffuse obscure type of pulmonary disease was found to have an undifferentiated type of malignant growth and another, sarcoid granuloma.

Not infrequently, you will find that you must tread water, let time pass, and observe the course of events. If it is an acute condition with fever and features suggesting a pneumonia, a few days of treatment with this or that drug and complete clearing of the lesion will settle the matter. Be sure, however, *that the lesion has completely cleared.* In the case of pneumonia the final film is more important than the initial film. In Fig. 13, for instance, you see the film of

Figure 13

a man who entered the hospital with a typical picture of acute pneumonia. He promptly became well under treatment. Yet even so a repeat film taken when he seemed quite recovered showed this residual lesion in the right lung. It represents atelectasis. It is due to the plugging of a bronchus by a bronchogenic carcinoma. The apparent acute pneumonia was caused by infection within the atelectatic portion of the lung. This infection cleared concomitant with the use of antibiotics, leaving the atelectatic lesion. Prompt thorough study was negative. The chest was then opened and the true nature of the disease found.

At this point I should like to interject a remark about pulmonary tuberculosis. Its treatment is now almost completely socialized, and the average practitioner sees the patient only during the diagnostic phase. Nevertheless, occasionally you may be re-

sponsible for following a TB patient, who has presumably a "cured" inactive lesion. Do not forget to see that such a patient has a film at least every six months, regardless of how many years he may have been inactive. In Fig. 14 you can see the film of

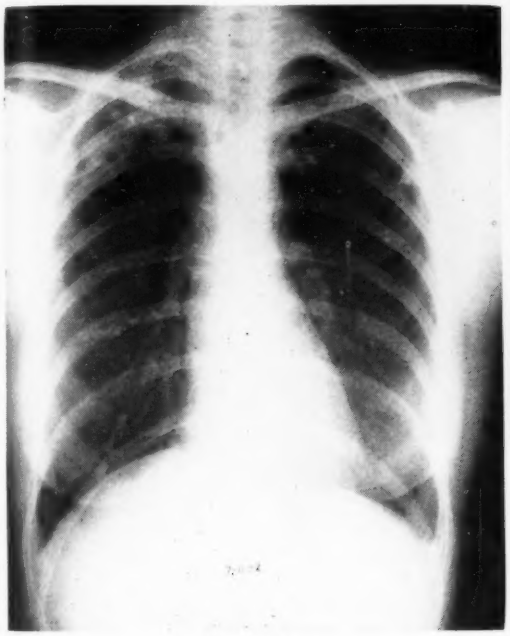

Figure 14

a middle-aged woman, who had had no change in her condition for seven years. In Fig. 15 you see a film taken as a routine six months later. It shows extension of her disease and the development of a cavity on the right. She disclaimed any warning symptom.

Now, finally, let us suppose we have a patient with a lesion, symptomatic or asymptomatic. The diagnosis is not immediately clear. We simply go through this diagnostic chain of events, link by link. Somewhere along the way the diagnosis may become evident. If so, well and good. If not, we finally come to the ultimate point—thoracotomy. One should not wait long to do it. If in four to six weeks no definite diagnosis has been made, thoracotomy must—with rare exceptions—be done. You can consider individual factors such as age, sex, tuberculin reaction, lack of change in size,

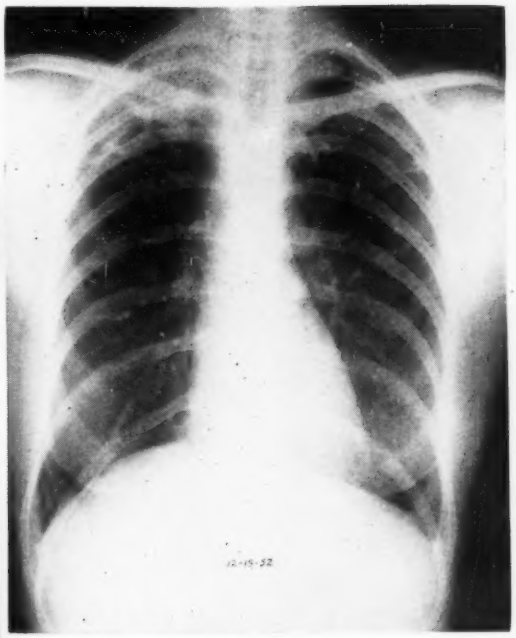

Figure 15

and so forth, yet in the last analysis you are leaving the matter to chance if you do not do a thoracotomy. If you are lucky enough to have a film taken five years previously, and there is no change in the interim, you are reasonably sure there is no cancer present. Yet some neoplastic lesions may change only very little in size over the course of many months. Observe in Fig. 16 the film of a 26 year old woman taken as a routine. She had never had a previous chest film. Complete study was negative. A skin tuberculin test was negative. Films at reasonable intervals showed no change when compared each latest with the previous one. Within six months her skin tuberculin test became positive. No symptoms developed. She was followed for *two and one-half years* in this fashion. Finally, the latest film was compared with the first film and definite increase in size was seen—see Figs. 17, 18, 19, 20. Again complete study was negative. Thoracotomy was done and a localized (as far as could be determined) bronchogenic carcinoma was found. Lobectomy was done and she has since remained well—a period of two years. In Fig. 21, you see the film

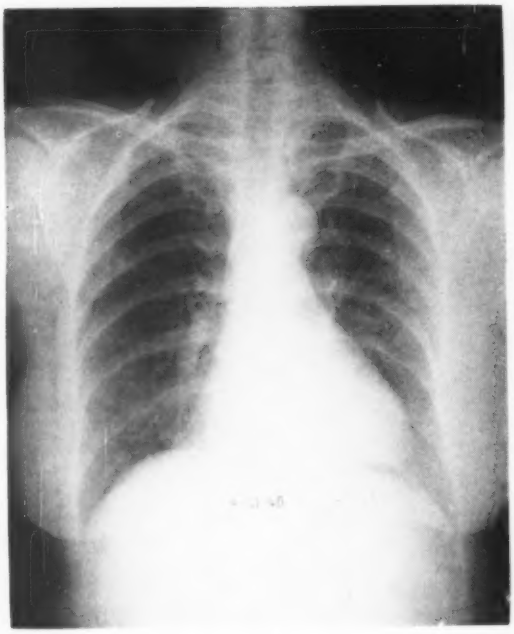

Figure 16

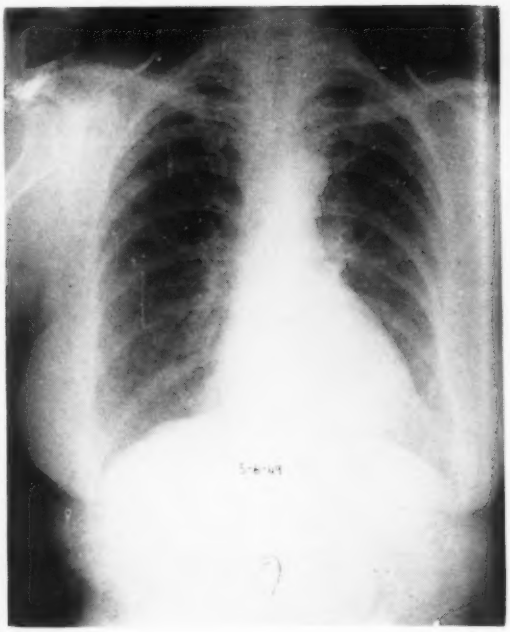

Figure 18

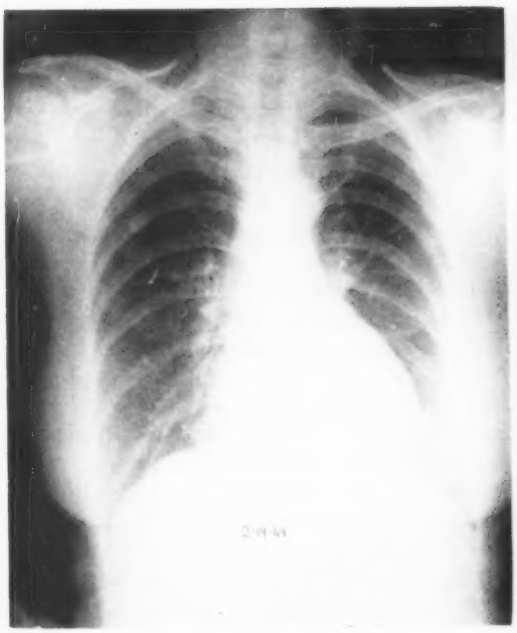

Figure 17

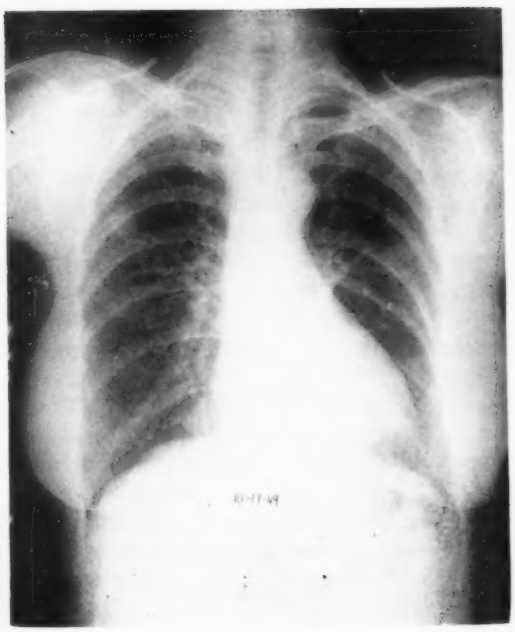

Figure 19

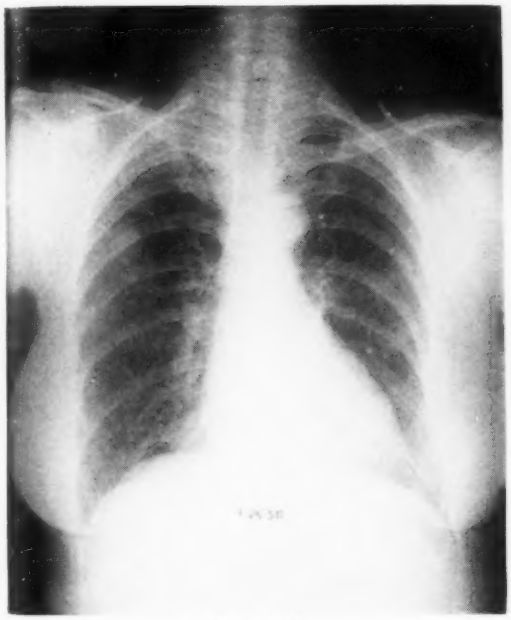

Figure 20

Figure 21

of a 58 year old man taken as a routine and showing a lesion in the left lung. All studies were negative except a skin tuberculin test. It was decided to watch him for a while. The next film was taken seven months later and you can see in Fig. 22 what happened.

Figure 22

Next is the film of a 42 year old chain-smoking male who had a routine annual film 6 months previously. It was decided to watch him for six months. Then a repeat film was exactly the same, Fig. 23. Complete study at this time, including gastrointestinal and renal x-ray examination, was negative, except for a positive skin tuberculin test. Six months later his film looked like this, Fig. 24. The lesion has become larger. Three months later, one year following the discovery of his lesion, he was dead of extensive organic and skeletal metastases from the bronchogenic carcinoma. The final illustrations are of the chest of another 42 year old chain-smoking male who showed a small lesion in his right upper lung on routine semiannual examination, Fig. 25. Many previous films had been negative. Complete study was negative, except for a positive skin tuberculin test. Monthly films were taken and the comparison of each latest film with the previous

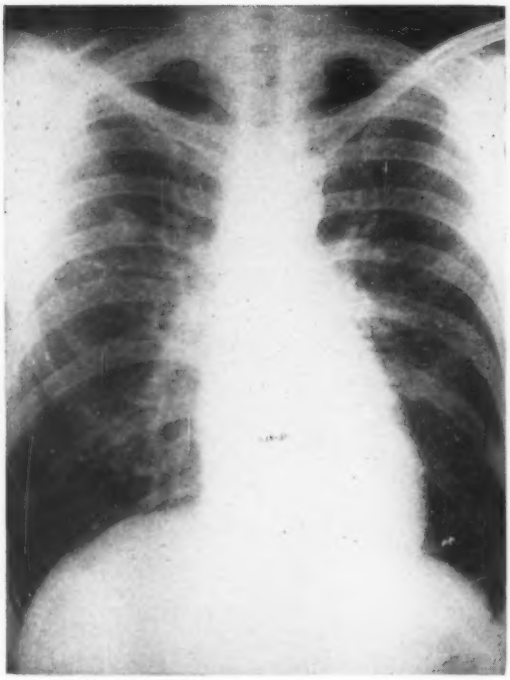

Figure 23

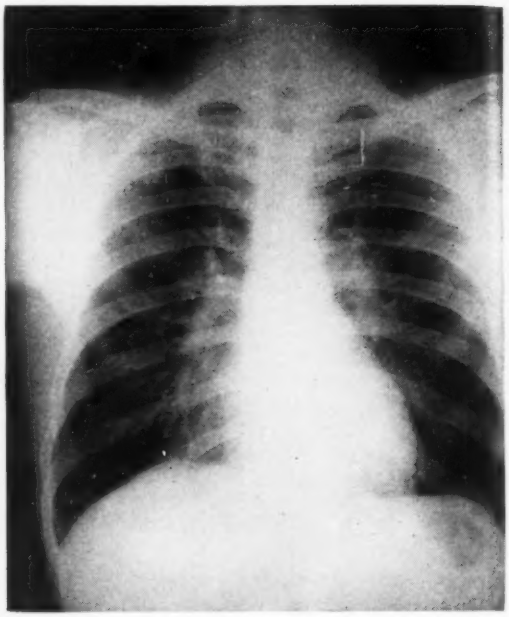

Figure 25

film showed little change from film to film. However, after two and a half years, the latest film compared with his first film showed definite increase in size and density, (Fig. 26-29). Thoracotomy was immediate-

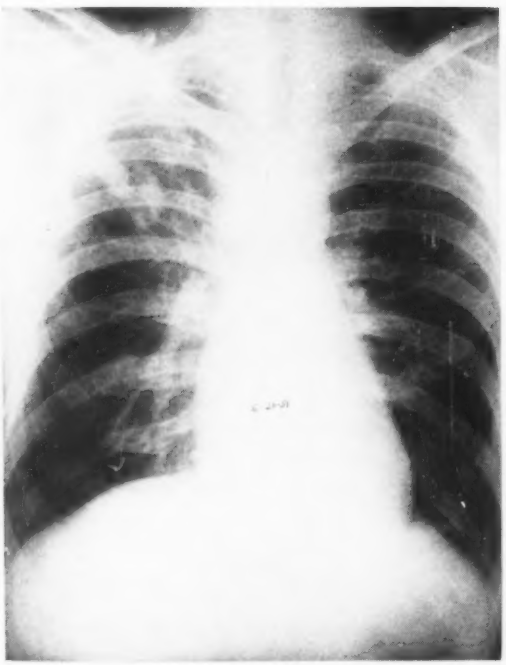

Figure 24

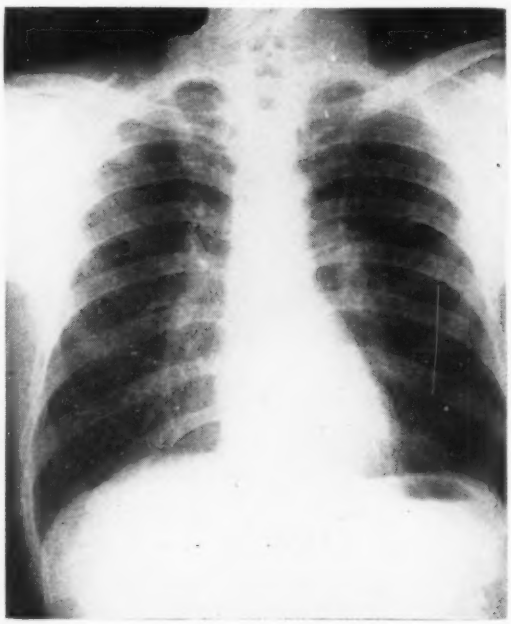

Figure 26

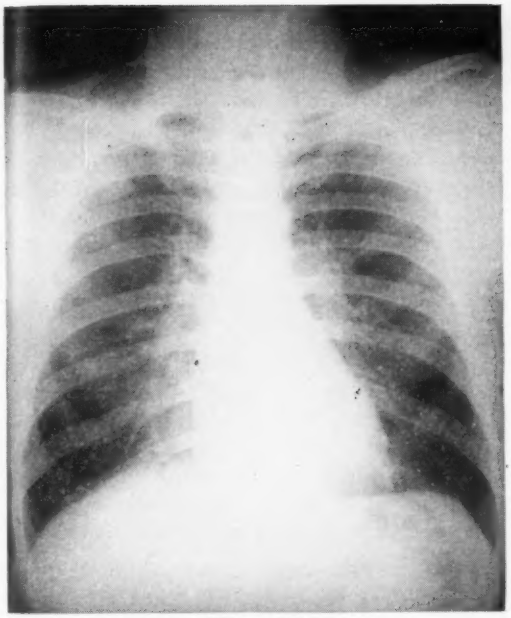

Figure 27

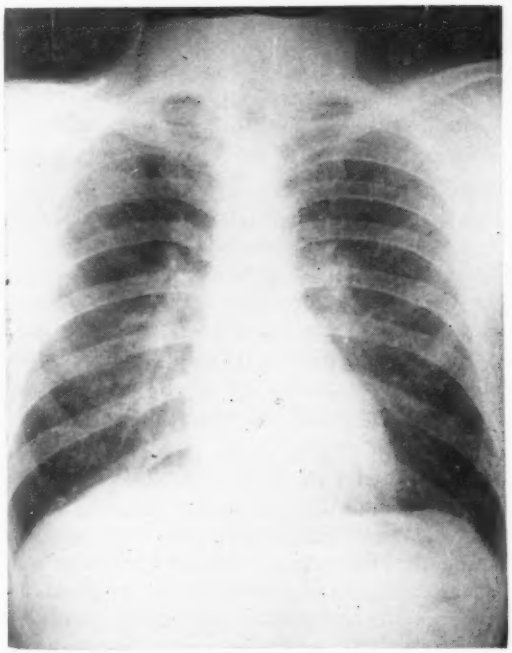

Figure 28

ly done and a localized bronchogenic carcinoma found. He no longer has a right lung, but is carrying on his usual work, now six months later.

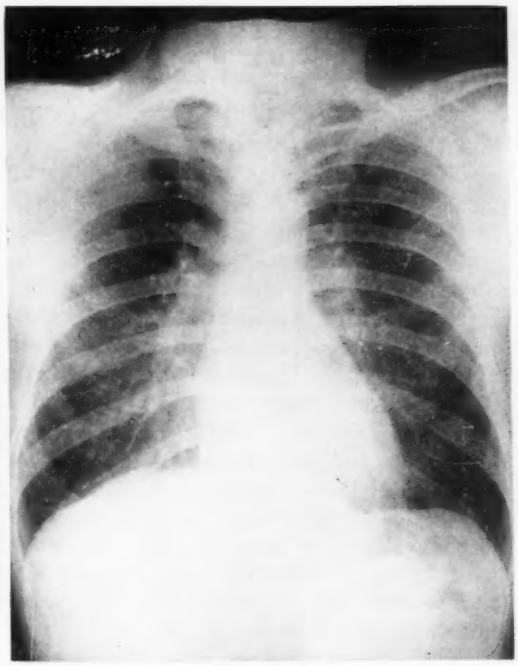

Figure 29

SUMMARY

Now let us skeletonize the moral of the story. Find the lesion. Follow it. Try to determine by logical study if it is infective. If so, is it acute, chronic, active, or inactive. Is it neoplastic and, if so, is it malignant or benign, primary or secondary, localized or disseminated? Then act accordingly. If by complete careful study you cannot definitely determine the nature of the trouble, then don't hesitate, don't dodge the question, don't mumble and turn your eyes away, don't put the burden of decision on the patient just to relieve your own mind. Don't worry about removing benign lesions. Do face the issue squarely. You know what must be done. Do it—thoracotomy. Only in this way will you ever remove the lung crab before its tentacles reach too far.

Here is the summary in three lines:

1. Routine chest films.
2. Follow all abnormalities.
3. In case of doubt do thoracotomy early.

I will conclude with this: If you remember two words that have been said, the effort of this presentation will have been more than amply justified. These two word are: EARLY THORACOTOMY.

LABORATORY DIAGNOSIS OF FUNGUS DISEASES*

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An approximately accurate clinical diagnosis can be made by inspection of the lesions produced by fungi which are limited in their invasiveness to the skin, hair, and nails. The diagnosis can be suspected in patients having rhinosporidiosis, chromoblastomycosis, maduromycosis, cervicofacial actinomycosis and the dermal forms of sporotrichosis, coccidioidomycosis, North American and South American blastomycosis.

Infections of the lungs and other internal organs produce symptoms and signs which are so pleomorphic that it is rarely possible to suggest that a particular fungus is the most likely etiologic agent. In most instances the possibility of a fungus infection is not considered until the more common diseases such as syphilis, tuberculosis, neoplasm, and lymphomas have been eliminated by appropriate studies. After a suspicion of a fungus infection has been aroused the diagnosis must be established in the laboratory.

The laboratory procedures of primary importance in the diagnosis of fungus infections are (1) direct examination of pus, sputum and other secretions or exudates, (2) biopsies, (3) cultures, (4) skin tests and (5) serologic tests.

DIRECT EXAMINATIONS FOR FUNGI

The most rapid and economical method of diagnosis is the detection of the specific fungus by direct examination. This method is employed routinely in the study of the dermatological lesions of the skin, hair, and nails. The presence or absence of a fungus can be established in most instances but sometimes the particular genus or species involved must await the growth in cultures.

The detection of budding yeast cells, accompanied by characteristic hypha in bits of white membrane from the mouth or throat establishes the diagnosis of thrush. The presence of sulfur granules, composed of thin branching gram positive filaments, in the pus from a draining sinus confirms the clinical diagnosis of actinomycosis. The presence of partially acid fast rods, of the size and shape of tubercle bacilli but with side branches, in smears of sputum, pus and secretions after staining by the Zeihl-Neilson technique certainly suggests the diagnosis of nocardiosis.

Tiny bits of pus expressed from the spreading edge of a lesion in the skin can be mounted in 10 per cent sodium hydroxide and examined directly for the characteristic tissue phase of the organisms causing coccidioidomycosis, chromoblastomycosis and North American and South American blastomycosis.

Cryptococcus neoformans (*Torula histolytica*) from the skin, subcutaneous tissue, sputum, or spinal fluid resembles an ordinary budding yeast cell when examined in fresh mounts. The diagnostic feature of this organism is a very large, almost transparent gelatinous capsule which is easily demonstrated by adding a drop of India ink to the drop of exudate before covering the preparation with a coverslip.

Histoplasma capsulatum is primarily an intracytoplasmic parasite and is not usually recognizable unless stained. Smears should be made on cover glasses from blood, pus, bone marrow, or lymph nodes and stained with the Giemsa or Wright blood stains. The Leishmania-like yeast cells are found in the cytoplasm of infected endothelial cells and in monocytes.

Unstained mounts of secretions from the pseudo-polyps of rhinosporidosis show the characteristic large spherules with several hundred endospores. These spherules are several times as large as the spherules found in coccidioidomycosis. In this instance, the organism cannot be cultivated and the diagnosis must be established by direct smears or by biopsy.

Sporotrichosis affords an interesting contrast to rhinosporidosis. Direct examination is a futile procedure for the detection

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of *Sporotrichum schenckii* since this organism is almost never seen by direct examination either in fresh mounts or in biopsy sections but fortunately grows readily when planted on appropriate media.

Although the direct examination is the most rapid and economical method available for diagnosis a degree of skill and experience comparable to that of a parasitologist is required to obtain reliable results. There are many artefacts in pus, tissue extracts, and sputum which may be mistaken for fungi. The most confusing artefacts are the so-called myelin granules of the sputum which have well defined cell walls and vary greatly in size so that one finds not only pseudo yeast and blast cells but psuedo budding as well. When typical fungus organisms are present in abundance, and this happens in pus from lesions and sometimes in the sputum, the diagnosis by direct examination is rapid and conclusive. In general, however, direct examination is not as reliable as cultures. Many specimens negative for fungi by direct examination will yield a heavy growth when planted on suitable media.

BIOPSIES FOR DIAGNOSIS OF FUNGUS DISEASES

The biopsy is a very valuable procedure in the diagnosis of fungus diseases provided the tissue is cultured as well as sectioned. The type of tissue reaction alone does not permit a definite diagnosis but when typical organisms are present the diagnosis is rapid and quite as reliable as by culture. The new periodic acid staining technique of McManus is definitely superior to staining by the hematoxylin-eosin or Giemsa's method. Occasionally, organisms are found in tissues by the McManus method when cultures from the same tissue fails to yield a growth, but more often the reverse is true where the cultures are positive and the sections negative. This is almost always true of tissues from patients with sporotrichosis as noted above.

CULTURES FOR DIAGNOSIS OF FUNGUS DISEASES

Cultures are slower than direct examination and biopsy methods but in general are more reliable and require less diagnostic skill on the part of the laboratory staff. Even where pure cultures are not readily identified they can be mailed to a diagnostic center for a final opinion or diagnosis. It is not practical to ship original materials of pus, sputum, or tissues to diagnostic centers for culture since the cells degenerate and saprophytic bacteria completely overgrow and eliminate the pathogenic fungi.

Actinomyces bovis is anaerobic and requires a rich medium for growth. Fortunately all the other fungi which cause systemic infections in man are aerobic and will grow on a modified Sabouraud's medium which is a simple peptone agar of *p*H 5 to 6 which contains 1 per cent dextrose. The rate of growth varies with the type of fungus. Monilia, Aspergillus, Penicillium, Mucor and Geotrichum grow rapidly with the production of large colonies in four to five days. Isolated colonies should be picked for subculture but the original tubes should be kept for at least thirty days. *Cryptococcus neoformans* and *Sporotrichum schenckii* may appear after ten to fourteen days, and *Histoplasma capsulatum, Coccidioides immitis* and *Blastomyces dermatitidis* after twenty days. It is most important that the tubes showing an early growth of Monilia are not discarded. We have found Monilia as a secondary invader in cases of blastomycosis, cryptococcosis, histoplasmosis and coccidioidomycosis. The saprophytic form of *Histoplasma capsulatum, Coccidioides immitis* and *Blastomyces dermatitidis* give a growth which resembles a tuft of white cotton. Before the development of characteristic spores these fungi cannot be distinguished from each other or from certain nonpathogenic fungi which may appear on the media.

The yeastlike tissue phase of *Blastomyces dermatitidis* grows readily in seven to ten days when inoculated on blood agar and incubated at 37°C.; and the tissue phase of *Sporotrichum schenckii* grows well on the cystine medium designed for the cultivation of *Past. tularensis.* Nocardia grow equally well on dextrose agar, blood agar, or the special media used for growing *Myco. tuberculosis*, but unlike tubercle bacilli they are destroyed by the various types of concentra-

tion procedures commonly used to eliminate contaminants from tuberculous material. The tissue phase of *Histoplasma capsulatum* may grow on blood agar or in special fluid media when incubated at 37°C. Sometimes on these media the growth starts at the tissue phase and changes over to the saprophytic moldlike phase even when growing at 37°C. The spherule endospore tissue phase of *Coccidioides immitis* has been grown occasionally on artificial media but most stains grow only in the saprophytic form even on rich media at 37°C. However, an abundant growth of the spherule-endospore form can be obtained by inoculating the material into the yolk sac of embryonated eggs.

Various modifications of the basic media have been advocated with the object of making the media more selective for fungi. In Littman's oxgall modification, gentian violet is added to suppress bacterial growth. This modification is definitely superior to the usual Sabouraud's medium for the isolation of the dermatophytes from skin, hair, and nails and for the isolation of fungi from stools. It has definite limitations however, since the gentian violet inhibits the the growth of *A. bovis, Nocardia asteroides, Candida albicans,* and partially inhibits the growth of *Histoplasma capsulatum*. The addition of 100 units of penicillin and 100 micrograms of streptomycin to blood agar medium efficiently eliminates bacteria without affecting the yeastlike and moldlike fungi. But the antibiotics prevent the growth of *Actinomyces bovis* and *Nocardia asteroides* and related species of Nocardia.

SKIN TESTS IN DIAGNOSIS OF FUNGUS DISEASES

The diagnosis of an active fungus infection cannot be established by means of skin tests, but under certain conditions, a negative test may be said to eliminate the possibility of the fungus disease in the same manner as a negative tuberculin test may be used to eliminate the possibility of tuberculosis.

Histoplasmin, coccidioidin, blastomycin, and tuberculin skin tests should be used in the study of patients suspected of having mycotic infection. These tests are often useful but also may be misleading. They should be administered, and interpreted in a manner analogous to the tuberculin test. Certain points should be emphasized. The skin tests are negative in initial stages of the infection and some rapidly advancing cases, especially in histoplasmosis, progress to death without ever developing a positive skin test. Terminal cases of histoplasmosis, coccidioidomycosis, and blastomycosis, like terminal cases of tuberculosis, frequently become anergic and give negative skin reactions. A positive skin test, like a tuberculin test, means present or past infection.

There seems to be a small amount of a common antigen in *Coccidioides immitis, Histoplasma capsulatum* and *Blastomyces dermatitidis* and this results in some cross reaction in the skin tests. For this reason histoplasmin, coccidioidin and blastomycin should always be administered simultaneously regardless of which mycosis is suspected. Only those patients with excessive sensitivity to coccidioidin, e.g. positive to 1:10,000 dilution, give cross reaction with histoplasmin or blastomycin. Cross reaction between histoplasmin and blastomycin are much more common, with the major cross being between histoplasmin and blastomycin. In our experience, individuals with marked positive skin tests to histoplasmin usually give reactions to blastomycin or standard Blastomyces vaccine which are from 25 to 50 per cent as large as the specific reaction to histoplasmin. Such an individual may give a larger reaction to blastomycin than some patients with proven blastomycosis. Patients with large reactions to blastomycin may give smaller reactions to histoplasmin. The specific test is always larger when the three antigens are given simultaneously and no difficulty is encountered in interpretation.

SEROLOGIC TESTS IN DIAGNOSIS OF FUNGUS DISEASES

Precipitin tests are useful in detecting the presence of early and mild infections with *Coccidioides immitis* and *Histoplasma capsulatum*. In progressive disease the precipitin titers decline and finally disappear although the complement-fixation test may be

steadily rising. There is no precipitin test for North American or South American blastomycosis.

The complement-fixation test for blastomycosis was introduced by Martin in 1933. The antigen was prepared from the pulverized bodies of the tissue phase of *Blastomyces dermatitidis*. C. E. Smith of California used coccidioidin for the antigen and perfected a complement-fixation test for coccidioidomycosis. The antigen used in the complement-fixation test for histoplasmosis may be histoplasmin or the yeast phase of the organism.

Complement fixing antibodies are not stimulated by subclinical infections or even mild clinical infections or, if present, are not in amounts sufficiently high to be detected by the methods now in use. Apparently a rather marked stimulation of the tissues is necessary to induce demonstrable amounts of complement fixing antibodies. A positive complement-fixation test should be interpreted as evidence of active infection and unlike the skin test the titer continues to rise in terminal cases. Conversely the titer declines as the patient improves and disappears after recovery.

There is little, if any, cross complement fixation between the sera of patients with coccidioidomycosis and the histoplasma and blastomyces antigens. There is, however, a marked cross reaction between the sera of patients with active histoplasmosis and the blastomyces antigen. The cross reactions in the reverse direction are minimal. A patient with active histoplasmosis may give a higher titer of fixation with a blastomyces antigen than a proven case of blastomycosis may give with the same antigen. For these reasons sera should be run in parallel against both histoplasma and blastomyces antigen. When this is done, difficulties are rarely encountered in interpretation, although there are some recent reports in which patients with blastomycosis have given higher titers with the histoplasma antigen than with the bastomycin antigen and vice versa.

SUMMARY

The laboratory diagnosis of fungus diseases is not really difficult. The multiplicity of cellular and colony forms which at first seem to make mycology more complicated than bacteriology in the end make it simpler when the laboratory worker has become familiar with these characteristic structures.

SURGICAL TREATMENT OF PULMONARY DISEASES

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Pulmonary diseases subjected to surgical measures were reviewed to determine current trends. The cases selected were treated on the Independent Surgical Unit of Charity Hospital for a five year period ending January 1953.

TUBERCULOSIS

Thoracoplasty provides safe and effective collapse therapy of the affected lung. It was employed in patients with minimal lesions and positive secretions who did not respond to bed rest, antimicrobial therapy, pneumoperitoneum, and other measures. Contraindications to thoracoplasty are: exudative disease, tension cavities peripheral cavities and lower lobe disease. Seven or 8 ribs are removed in the procedure which is divided into three stages. The first 3 ribs with their transverse processes are removed at the first operation and the remaining ribs are excised in two stages at intervals of two weeks each. Complications of the operation are: contralateral spread, empyema and wound infection.

Lobectomy removes the tuberculous focus which is spilling tubercle bacilli. Cases of thoracoplasty failure, bronchostenosis, tuberculoma, tuberculous bronchiectasis, and tension cavities are treated by lobectomy. If the condition of the patient permits, thoracoplasty is done at the time of lobectomy in an effort to prevent overdistention of the opposite lung. The second to the fifth ribs inclusive are removed. Four lobectomies with concomitant thoracoplasty

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and 1 without thoracoplasty were done with satisfactory results in all cases.

Pneumonectomy is a last resort procedure reserved for cases of chronic bronchial disease, destroyed lung, collapse failure, and diagnostic problems. Thoracoplasty is combined with pneumonectomy also and is done in one stage at a later date with the removal of the second to the sixth ribs. Of 5 patients receiving this combined procedure contralateral spread was responsible for the death of 3 within six months after surgery. It is of interest that 1 of the patients had received treatment for fourteen months because of positive sputum and positive gastric washings for acid fast bacilli, but the lesion proved to be an anaplastic carcinoma instead of an extensive tuberculoma.

CARCINOMA

Pneumonectomy is the only curative measure for bronchogenic carcinoma. To include all avenues of spread and to increase the possibility of cure, wide removal of the mediastinal nodes is done when feasible. Eight such exploratory thoractomies were done on supposedly early lesions only to encounter inoperable malignancies in 5. If pulmonary function studies indicate a low reserve and pneumonectomy is considered too formidable, lobectomy may be employed as a measure of palliation. Two of the lungs removed for malignant disease revealed coexistent tuberculosis at the time of pathological examination.

BRONCHIECTASIS AND LUNG ABSCESS

Removal of he diseased portion of the lung in the above is effected by lobectomy. In bronchiectasis, bilateral lower lobectomy is necessary in some instances. Segmental resection, the most recent technical advance in pulmonary resection, is the removal of bronchovascular subdivisions of the lobe itself. It is especially useful in bilateral bronchiectasis when it is imperative to preserve as much normal lung tissue as possible.

CONCLUSIONS

Current surgical procedures employed in the treatment of pulmonary disease are listed.

STRANGULATION OBSTRUCTION; RECENT EXPERIMENTAL WORK*

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The mortality in strangulation obstruction remains alarmingly high. In two recent studies of strangulation obstruction in New Orleans, the mortality was 30 per cent[1] and 46 per cent.[19] In a Charity Hospital series, the mortality was 30.6 per cent for cases with strangulation versus 6.7 per cent for simple obstruction.[1] In that paper the difficulty in differentiating simple and strangulated obstruction was pointed out, showing the need for further knowledge about strangulation obstruction. Recent developments in the control of intestinal bacteria, in the use of blood, plasma, and electrolytes—particularly potassium[29]—and in the understanding of absorption of toxic agents, warrant re-evaluation of the status of experimental strangulation obstruction.

It was with these thoughts in mind that the author engaged in the study of experimental strangulation obstruction. Some recent developments can now be summed up.

EXPERIMENTAL STUDIES

Our earliest work[22] was a base-line study of experimental strangulation obstruction, since there were no well controlled studies with the extensive use of blood, plasma and electrolytes. A standard method for the study of strangulation obstruction in dogs was developed, utilizing an obstructed bowel with ligation of all veins to a 30 cm. segment. Blood, peritoneal fluid, and bowel contents were subjected to serial electrolyte, bacteriologic, and spectrophotometric studies. Survival ranged from twenty-eight and a quarter to forty-eight hours, with an average of thirty-six hours. This was an improvement over previous survivals of four to twenty-nine hours[10, 11, 13, 18, 21, 31]. Clinically, the animals seemed to be in comparatively good condition until a few hours

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before death, when they suddenly became much sicker and began vomiting copiously. The terminal phase was characterized by convulsive movements of the extremities and gasping respirations. Temperature elevations were not correlated with death. At autopsy the outstanding findings were: The strangulated segment was dark reddish black, elongated, dilated, thin, friable, degenerated, sharply demarcated from adjacent normal tissue, but not perforated. There was no evidence of peritonitis and there were no adhesions.

Many changes in clinical condition, nitrogen chemistry, peritoneal fluid character and spectrophotometric observations could be closely correlated. In the early stages peritoneal fluid was light pink, odorless, coagulated easily, and contained normal red cells. Later on it became foul-smelling, blackish, no longer coagulated, and contained only hemolysed cells. Much earlier in each experiment the bowel lumen contents resembled this late peritoneal fluid. Spectrophotometrically the early pink fluid contained only oxyhemoglobin, but the late "dark" fluid contained some new pigment which was not definitely identified then (nor has its identity been completely discovered even yet). This spectrophometric observation aided in tracing the sequence of events. The new pigment was observed relatively early in the bowel contents. It appeared late in the peritoneal fluid and subsequently in the blood stream. This showed absorption of any noxious substance was from the bowel lumen to the peritoneal fluid and then into the circulation.

Toxicity of the peritoneal fluid was investigated by intraperitoneal or intravenous injection in normal dogs.[23] In no case was the amount or the speed of injection sufficient to cause circulatory embarrassment. The early, pink fluid was uniformly without effect. The late, dark fluid, on the other hand, was lethal in a matter of several hours.

CLINICAL CONFIRMATION

Clinical confirmation of these experimental results seemed desirable. Accordingly, a study was undertaken of the correlation of the clinical picture with the bacteriology and spectrophotometry of the peritoneal fluid in clinical strangulation obstruction.[3] Over a two year period 18 cases were studied. Chart No. 1, summarizing this work, correlates the data as compactly as possible. Conclusions of that study were: (1) No significant spectrophotometric changes were observed in simple obstruction, experimentally or clinically. (2) Peritoneal fluid was bacteriologically negative in simple obstruction. (3) Bacteriologic studies in strangulation obstruction not requiring resection may be negative. (4) Positive bacteriologic results occurred most commonly in peritoneal fluid from true strangulation obstruction. (5) Cases with positive bacteriologic findings in peritoneal fluid were associated with more postoperative complications than cases with negative bacteriologic findings. (6) Spectrophotometric findings similar to those observed experimentally were found in a single clinical case, demonstrating that this pigment can occur in the human. (7) The infrequent occurrence of positive spectrophotometric changes in clinical strangulation obstruction indicated that this did not correlate as well with the other factors as did bacteriologic study of peritoneal fluid.

CLINICAL COURSE CORRELATED WITH PERITONEAL FLUID STUDIES

	No strangulation No resection	Strangulation No resection	Strangulation Resection – fatal*
Negative bacteriology Negative spectrophotometry	2, 3, 4, 5, 6, 7, 8, 14, 15, 17	9, 10	16, 18
Neg. bact Pos. spectro	—	—	—
Pos. bact Neg. spectro	11	1	12
Pos. bact Pos. spectro	—	—	13*

CHART I

Correlation of peritoneal fluid studies with clinical course of 18 cases of suspected strangulation obstruction.

CL. WELCHII

Following the above observations our attention was focused on *Cl. welchii* for these reasons: (1) *Cl. welchii, B. coli,* and nonhemolytic strep. were the only organisms uniformly present in the peritoneal fluid. (2) Antibiotic protection had not been

used, though Blain and Kennedy had previously prolonged survival with penicillin.[2] (3) The failure to coagulate of later peritoneal fluid might have been correlated with fibrinolysins of *Cl. welchii*. (4) Hemolysis of red cells in the late fluid suggested hemolysins and lecithinases of clostridia. (5) Histologic sections of the strangulated bowel suggested gas gangrene. (6) The absence of leukocytic response in the bowel wall in spite of obvious bacterial invasion suggested clostridial leukocidins.

Other workers have also noted correlations with Welch organisms. Tanturi, Anderson, and Canepa demonstrated lecithinase and hyaluronidase in the intestinal contents of dogs with strangulation obstruction.[30] These substances were also found in peritoneal fluid of animals with strangulation obstruction and in thoracic duct lymph.[15]

In a study of the effects of intravenous injection of *Cl. welchii* lecithinase[12] Laufman's group noted: Shock-like state, hemolysis of red cells, and death in a few hours. Action of the toxin was observed on the cellular elements of blood, the most dramatic action being the early rapid destruction of the platelets, and later of red and white cells.

To further evaluate *Cl. Welchii* in strangulation obstruction it was desirable to avoid the complications of obstruction-vomiting, fluid and electrolyte loss, bleeding in the gastrointestinal tract, and creation of an ideal culture media. To achieve this, we utilized a completely isolated, closed loop of bowel, placed in the peritoneum of a normal dog.[8] This was demonstrated to have many effects of strangulation obstruction without its undesirable complications. To rule out autolysis of sterile tissue as a cause of symptoms in strangulation obstruction, similar loops of bowel were autoclaved before being placed in the peritoneum. Loops adequately autoclaved were without effect. Sterile, autoclaved bowel plus a sublethal dose of *Cl. welchii* was fatal. To obviate the objection that autoclaving changes the nature of the tissue completely by altering protein structure, destroying enzymes, etc., fresh tissue was used in its place. Fresh sterile bowel was obtained by allowing both ends of an isolated well vascularized bowel loop to remain open in the peritoneal cavity since exposure of bowel mucosa to peritoneal secretions for several weeks sterilizes it.[8, 14] The bowel was severed from its connections, and placed in the peritoneal cavity with a sublethal dose of *Cl. welchii*, again giving fatal results. *Cl. welchii* in the peritoneal fluid was associated with a rise and then a fall in white cell counts of blood and peritoneal fluid. The fall was ascribed to leukocidins produced by Welch organisms. It was concluded that neither sterile tissue nor *Cl. welchii* placed intraperitoneally caused death, but when combined a lethal result occurred, due to exotoxins of *Cl. welchii* produced in dead or dying tissue. This was similar to the effects noted in strangulation obstruction.

PANCREATIC AND BILIARY SECRETIONS

Pancreatic and biliary secretions have been considered essential for toxicity in strangulation obstruction by some observers.[24] While not denying that bile, activated pancreatic juice, or duodenal secretions would increase toxicity of intraluminal contents of a strangulated loop, I have not been convinced that this was essential. Experimental verification of my viewpoint was sought by the production of strangulation obstruction in the absence of all duodenal, biliary, and pancreatic secretions.[7] This was done as follows: A modified Mann-Williamson operation diverted all duodenal contents to the low ileum. After several weeks, during which the animal returned to a relatively normal state, and all duodenal secretions passed below the jejuno-ileostomy, a second operation was performed. At this time, obstruction and strangulation were created proximal to the jejuno-ileostomy. The sequence of events was the same as for the original series. A prolonged survival was attributed to the absence of biliary, pancreatic and duodenal secretions to aid in the destruction of the strangulated loop. However, the failure to survive was the most important feature, showing that neither pancreatic, biliary,

nor duodenal secretions were essential for a lethal result.

ANTIBIOTICS

If bacteria are of paramount importance it should be possible to prolong life with antibiotics. Blain and Kennedy[2] obtained prolonged survival with postoperative penicillin. However, their dogs also died, and many workers believed that this was sufficient proof that bacteria were not the ultimate answer. Poth and McClure[25] used preoperative sulfathaladine to prolong survival in dogs with vascular damage to a segment of jejunum without obstruction. Uniform survival was not obtained with this technique. Antibiotics soon replaced sulfas, and much of the work on sterilization of the gastrointestinal tract has been reviewed by Riddell.[27] Dearing and Heilman[9] concluded that aureomycin was the best available agent for preoperative intestinal antisepsis.

In a study of strangulation obstruction using aureomycin, Morton, Furth, Hinshaw, and Schilling[20] stated that postoperative aureomycin "appears to have certain beneficial effects in the lethal process. Animals treated preoperatively or during both preoperative and postoperative periods, however, fare little better than untreated controls." Their animals received no postoperative treatment except antibiotics, and we believed this was in no way comparable to our own work in which the animals were protected against fluid, electrolyte, and blood loss.

Using the techniques of our original study, a new series was undertaken with preoperative bowel sterilization.[5] Postoperatively, the dogs received parenteral penicillin and intravenous aureomycin 500 mg. twice daily. Average survival was increased to seventy-seven hours, twice the survival of our series without antibiotics. Probably as important as the prolonged survival were histologic changes in the strangulated bowel. There was almost complete destruction of bowel wall in the nonantibiotic series. By contrast there was a relatively normal appearance in the antibiotic series. The reduction of intestinal flora prior to strangulation had effectively prevented bacterial proliferation after strangulation even in the presence of severely reduced blood supply, hemorrhage, and relative anoxia. It was still not clear why further survival was not obtained. Later, Lepper et al [16, 17] and others[28] showed that large doses of intravenous aureomycin were toxic. Review of our data disclosed our animals had received aureomycin in the toxic range.[4, 6]

Obviously this was a paradox. The drug had prolonged the lives of our experimental animals and then had killed them. It occurred to us that maximum effectiveness of the drug without its toxic side effects might be obtained if the drug were introduced directly into the strangulated segment. Such a study is currently underway, and the early results suggest that the work of Rabinovici and Fine[26] can be duplicated in strangulation obstruction. The implications of this to the future therapy of strangulation obstruction remain to be evaluated.

SUMMARY

Proper attention to fluid, electrolyte, and blood requirements has significantly prolonged survival in dogs with experimental strangulation obstruction. Shortly before death sudden changes were noted in the clinical condition of the animal; character of peritoneal fluid; and nitrogen chemistry of blood, peritoneal fluid and bowel contents. A correlation was suggested between these changes and changes in the spectrophotometric curves of peritoneal fluid. Spectrophotometric changes served to demonstrate that "toxins" were absorbed from the strangulated loop by passage into the peritoneal fluid and then into the blood stream. Toxicity of the late peritoneal fluid was established by injection into normal dogs with lethal results. Clinical continuation of these studies indicated there was a better correlation between the clinical course of patients with strangulation obstruction and the bacteriology of the peritoneal fluid than with spectrophotometric observations of this fluid. While neither sterile tissue nor cultures of *Cl. welchii* had any effect when placed intraperitoneally in normal dogs, the combination produced

fatal results similar to those noted in strangulation obstruction. Fatality in strangulation obstruction was attributed to toxins of *Cl. welchii*. The course of experimental strangulation obstruction was not altered by the removal of activated pancreatic juice, duodenal or biliary secretions. Preoperative intestinal antisepsis combined with postoperative antibacterial agents was shown to significantly prolong life over all previous techniques. The course of future investigation has been suggested.

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SURGICAL TREATMENT OF HYPERTENSION*

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Hypertension and its sequelae, cardiac failure, renal failure, and cardiovascular accidents, are the principal causes of death. The mortality rate from hypertension and its sequelae is two to three times that of cancer.

Increased tension within the vascular

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system may be the result of a number of factors. Generally there is a decrease in the size of the lumen of the vessels, increasing the peripheral resistance and, therefore, pressure is increased. On the other hand, it may temporarily result from an increase in the cardiac output or an increase in blood volume. The last is undoubtedly influenced by sodium content of the plasma, and it is because of this influence that salt free and rice diets, and probably even total adrenalectomy,[1,2] are of value in the treatment of certain cases of hypertension.

TYPES OF HYPERTENSION

Hypertension may be divided into two large groups: primary and secondary. In the primary group are those individuals who are considered as vascular hyper-reactors, with latent hypertension, those with essential hypertension, and with malignant hypertension. Hines[3] designates as hyper-reactors those individuals who have normal blood pressure, but who under certain stimuli have increased blood pressure. He believes the hyper-reactors are more likely to develop hypertension later on. According to Hines a diagnosis of latent hypertension is justified in individuals who previously had some hypertension, but in whom at the time the blood pressure is normal and there is no evidence of hypertensive changes in the retinal vessels. Essential hypertension is a condition in which there is an elevation of blood pressure but in which there is no organic disease to account for it. Malignant hypertension is a hypertension in which there is a progressive increase in hypertension which is little affected by therapy. Malignant hypertension can be also secondary to renal lesions.

The secondary types of hypertension may be divided into several groups: (1) endocrine, (2) renal, (3) vascular, and (4) cerebral.

Of the endocrine lesions, neoplasia or hyperplasia of the suprarenal glands are most important. Tumors of the suprarenals may involve the cortex, as in Cushing's syndrome, or may be of the medullary type, as pheochromocytoma. On the other hand, hypertension may result from hyperplasia of the suprarenals. Lesions of the pituitary especially those affecting the anterior lobe in which there is an increase in basophilic cells can produce hypertension by causing adrenocortical stimulation. Although it is occasionally stated that hypertension is caused by hyperthyroidism, it must be emphasized that this condition is not a true hypertension because only the systolic pressure is elevated. Rarely the intercapillary glomerulosclerosis of the pancreas (Kummelstiel-Wilson syndrome) is a cause of hypertension.

Renal ischemia is a cause of hypertension. Bell and Pedersen[4] were the first to demonstrate that hypertension could be produced by interference with the renal vascular supply. Goldblatt et al[5] demonstrated that decrease in the arterial supply to the kidney produces arterial hypertension. Clinically, renal ischemia can result from thrombosis of the renal artery or vein, constriction of these structures by aberrant vessels, or by aneurysms of the renal artery. Other renal lesions which at times can produce hypertension are glomerular nephritis, atrophic pyelonephritis, polycystic kidney, periarteritis nodosa, and terminal renal disease.

Primary vascular lesions which will produce hypertension are congenital aortic lesions, coarctation, and arteriosclerosis. Aortic coarctation is the most frequent cause of hypertension in infants or young children and must always be considered. Characteristically, the hypertension is limited to the upper part of the body, and the blood pressure in the lower extremities which is normally slightly higher than in the upper extremities is either not obtainable or greatly diminished.

Cerebral lesions which cause an increase in intracranial tension result in hypertension undoubtedly because of cerebral anemia, the response being initiated to increase the blood supply to the brain. Another form of cerebral hypertension is diencephalic hypertension . At the outset it must be emphasized that hypertension is primarily a medical disease and that most patients with hypertension can and should be treated conservatively. There are many cases of hypertension, however, in which

surgical therapy is not only preferable but also the only one by which satisfactory results can be obtained.

SYMPATHECTOMY

Previously many patients with hypertension in whom the increase was due to a sympathico-adrenal overactivity were treated by operative procedures. However, with the introduction of the adrenergic blocking agents, sympathectomy is less frequently indicated. Sympathectomy and subtotal suprarenalectomy, either alone or combined with sympathectomy, have been used in the treatment of essential hypertension with variable results. Recently Thorn et al[1] have used total suprarenalectomy in the treatment of malignant hypertension. Although the blood pressure is reduced by suprarenalectomly, probably due to sodium and chloride loss, correction of suprarenal deficiency is likely to result in a return of the hypertension. Only time will tell whether the results will justify the continued use of this extremely radical procedure. It is our belief that even in malignant hypertension the judicious use of adrenergic blocking agents will probably be as satisfactory as sympathectomy or suprarenalectomy. However, if sympathectomy is chosen as a therapeutic procedure, it is imperative that a sufficient arterial denervation be accomplished to decrease the blood pressure. Because of this we believe that a thoracoabdominal resection of the lower seven dorsal ganglia and the upper two or possibly three lumbar ganglia be done bilaterally. This not only denervates a large portion of the vascular system but also permits exploration of both suprarenals at the time of sympathetic denervation. The combined thoracoabdominal procedure is much more radical than either the supradiaphragmatic or infradiaphragmatic procedures, but at the same time is not as radical as the total sympathectomy advocated by Grimson.[6] We believe a total sympathectomy is too radical a procedure and produces too many undesirable sequelae, such as severe postural hypotension, which is difficult to control. It is impossible to determine beforehand which patients will be benefited permanently by sympathectomy, and that in the individual in whom there is difficulty in maintaining a satisfactory control of the pressure by the use of adrenergic blocking drugs, sympathectomy is justified. However, as mentioned above, most cases of essential hypertension and even many cases of malignant hypertension will respond to the use of adrenergic blocking agents. Before satisfactory blocking drugs were available, we did many sympathectomies for hypertension, however, only after the internists had decided that conservative therapy was not successful. In approximately 25 per cent of these patients we had excellent results, in an additional 25 per cent there has been some decrease in blood pressure, but in approximately 50 per cent there has been no decrease in blood pressure whatsoever following the sympathectomy, although in practically all of them there has been complete relief of the symptoms.

Although the results following sympathectomy for primary hypertension are far from ideal, those following surgical correction of other lesions causing secondary hypertension are much more satisfactory. Suprarenal lesions, either cortical (Cushing's syndrome) or medullary (pheochromocytoma) are satisfactorily treated by either bilateral subtotal suprarenalectomy in the former or extirpation of the neoplasm in the latter. The relatively rare hypertension resulting from suprarenal hyperplasia and hyperfunction is relieved by subtotal suprarenalectomy.

PHEOCHROMOCYTOMA

A patient with a paroxysmal hypertension with marked fluctuation in the pressure should be suspected of having a pheochromocytoma. Because of the availability of the adrenergic blocking agents, pheochromocytomas are relatively easily diagnosed. Frequently, perirenal air insufflation is of value in visualizing the neoplasm, but even though a mass cannot be demonstrated, exploration of the suprarenal areas is justified. A slightly greater number of these tumors are found on the left side and for this reason if there is no evidence of tumor preoperatively, either abdominal exploration or left-sided exploration should be

used initially. Pheochromocytomas are found not only in the region of the suprarenal, but also may be found anywhere along the abdominal aorta down to its bifurcation and even in the thorax. Sprague et al[7] stated that approximately 10 per cent of pheochromocytomas are bilateral, 10 per cent are located extrasuprarenally (along the aorta or in thorax) and 10 per cent are malignant.

Recently, we observed a patient who had a large pheochromocytoma in the pelvis located approximately 4 centimeters distal to the bifurcation of the aorta and densely adhered to the left renal vein and artery. The diagnosis was made definitely preoperatively because of the characteristic decrease in arterial pressure following administration of adrenergic blocking agents. Because palpation on the left side of the abdomen caused an increase in arterial pressure, it was felt that the lesion was on the left side.

R. N., colored male, aged 20, admitted to Charity Hospital on December 10, 1952. Patient well until June 1952, when he had a severe headache accompanied by nausea and vomiting. His physician told him he had high blood pressure and gave him phenobarbital. He worked for one month and had a similar attack. He saw another doctor who gave him a low salt diet and "pills." However, frequent attacks of severe headache, with crampy abdominal pain, nausea and vomiting continued; three attacks in November. Blood pressure rose to 290 systolic; on one occasion was unconscious for five minutes. Upon admission to Charity Hospital a tentative diagnosis of a pheochromocytoma was made. Perirenal air insufflation was unsuccessful and patient did not want further tests and deserted from the hospital on December 24, 1952.

However, in the next three months he had an attack which lasted three days. He developed severe dyspnea on exertion, orthopnea and edema. He was readmitted on March 30, 1953.

Physical examination: Patient well-developed and nourished, 6'4" in height and thin. B. P. 170/110. P. 130. R. 28.

On admission, he had a hypertensive crisis with severe apprehension, pounding in the head and chest, nausea and vomiting, and generalized weakness. Blood pressure increased to 260/140. There were moist rales at both bases extending well up to scapulae. Neck veins became markedly distended. Patient developed a gallop rhythm and pulsus alternans.

The patient was digitalized, a phlebotomy was done, morphine was given with little relief. Benzodioxane by slow drip and by intramuscular route had little effect. Regitine was given 50 mg. orally every six hours with remarkable effect. Within an hour blood pressure dropped to normal, cardiac rhythm became normal. However, he had bronchopneumonia.

Laboratory Findings: Urine—Normal color, negative sugar and albumin and acetone. No cells in sediment. Blood Hgb. 70 per cent; RBC 3,510,000; Hct. 38; WBC 8400; Diff. Segs. 38; Bands 5; Eos. 2; Monos. 10; Lymphos 45; Sed. rate 53.

Chest X-ray: Bronchopneumonia left base.

Electrocardiogram: Suggestive of posterior infarction on numerous occasions.

Histamine test: 0.5 mg. i.v.

Blood Pressure. A primary drop and then rise within two minutes of inpection to over 300 mm. systolic. This was considered specific for a pheochromocytoma.

Of all drugs tried—dibenamine, tetra-ethyl ammonium chloride, benzodioxine, and regitine; only regitine caused blood pressure to drop to normal.

Pneumonia cleared and because of more frequent crisis a left suprarenal exploration was performed on April 7, 1953.

The left suprarenal was exposed and found to be somewhat enlarged. Because of this, the superior portion which appeared granular was extirpated. Because there was no alteration in the blood pressure during this manipulation, it was concluded that this was not responsible for the paroxysmal hypertension. The peritoneum was opened, the area of the right kidney and the entire course of the aorta were explored and nothing was found. However, a large mass measuring approximately 6 by 8 cms., intimately adhered to the left common iliac vein and artery, was found in the left pelvis. Manipulation of the tumor caused sudden rise in arterial pressure to 280 mm. Several large vessels connecting the tumor with the left renal vein were visualized and following their division and ligation the pressure dropped to 80/60, after which it was possible to remove the tumor without any further alteration in blood pressure.

Postoperatively, laevophed 24 gtts/min. was given intravenously, every six hours. Blood pressure taken every five minutes, remained 120/80. Postoperatively, patient responded well. He has had no further attacks. Blood pressure has remained 120/80; pulse 80; R 20. Electrocardiogram still shows posterior myocardial infarction.

Patient up on second postoperative day.

Histologic diagnosis of the tumor was pheochromocytoma.

RENAL ISCHEMIA

Cushing's syndrome with its characteristic manifestations of hypertension, moon face, buffalo hump, abdominal striae, obesity, hirsutism due to increased adrenocortical function usually is not difficult to diag-

nose. Suprarenal exploration and subtotal suprarenalectomy are justified.

Many renal lesions are associated with hypertension and because correctable renal ischemia may be responsible for hypertension, every effort should be made to determine whether renal ischemia exists. Although there are many of the opinion that all patients with unilateral kidney disease with hypertension can be satisfactorily treated by nephrectomy, the results in many of these cases have been quite disappointing. Burns[8] is of the opinion that one can determine preoperatively whether the patient might be benefited or not by determining angiographically whether the ischemia is in the renal artery or its major branches or whether it is in the kidney substance, and only in those cases in which the vascular occlusion involves the larger vessels can a satisfactory response be obtained by a surgical attack on the kidney or vessels. When, however, there is interference with the flow of blood through the renal artery or venal renal vein either as a result of thrombosis or constriction of the vessel by an aberrant vessel or some other structure or aneurysm of the artery, one can predict that hypertension will be relieved either by relieving the construction (such as division of an aberrant vessel) or by nephrectomy. It is of importance, however, to determine preoperatively just where the vascular occlusion is, because otherwise an unnecessary procedure might be avoided. An interesting example of hypertension from renal ischemia is the following:

N. R. L., nine-month old baby male, first seen at the Ochsner Clinic on July 28, 1952. For two or three months child had low grade fever, vomiting, failure to gain weight. On admission this child seemed vigorous and healthy, although not plump. He had a height of 26-2/3" and weight of 16 pounds. Blood pressure was 200/180 in the right arm and the same in the left arm. (The child's blood pressure had never been taken before). Blood pressure in the leg was 210/180.

Examination of the eye grounds: spastic arteries and a macular scar in the right eye. There was no papilledema.

Laboratory studies on admission revealed a hemoglobin of 14.2 gm., red cells 5.2 million, white cells 18,160 with a normal differential. The sedimentation rate was 60. The urine was examined on many occasions and always showed 3 to 4 plus albumin. Specific gravity was usually 1.002 or 1.003. After thirteen hours without any fluids by mouth, the specific gravity was 1.008 with albumin 3 plus. Some specimens showed 1 to 2 red cells and 2 to 4 white cells/hpf, but there was never any real hematuria or pyuria, and no casts were seen. The stools were negative for parasites. Blood urea nitrogen was 19 on one occasion and 15 on another. Serum calcium and phosphorus were normal. Serum chloride was 91 mEq/L., and serum CO_2 was 26 mM/L. The spinal fluid was clear, under normal pressure with protein of 25, and only 2 cells/cu. mm. Serum sodium was 135.8 mEq/L., and potassium 3.59 mEq/L.

X-rays and fluoroscopy of the chest revealed normal heart and lungs, but on the esophogram it appeared that there was an extrinsic lesion compressing the esophagus from the left. Our findings were identical with those found by the patient's local physician. The kidneys, ureters, and bladder were well visualized after intramuscular injection of neo-iopax and appeared normal. Soft tissue shadows of the kidneys were normal in size and position. X-ray of the skull was negative. The child was tested with benzodioxane and the response was normal. Following injection of the drug, the blood pressure rose moderately and did not fall at all. The same test was repeated, using regitine, with the same result. Although these tests seemed to exclude a pheochromocytoma, the evidence of a mediastinal mass suggested that such a tumor might be present in the mediastinum, especially when there was little evidence of other disease that might cause the hypertension. On August 7, 1952, the patient was operated upon and the mediastinum was exposed from the left side. The region where the x-ray had indicated a mass was thoroughly explored; and the esophagus was visualized throughout the middle third of its length. An enlarged lymph node was found and removed. This was found to be hyperplastic. The child made a remarkably rapid and uneventful recovery. In spite of this, the child continued to have a very high blood pressure with dilute urine and albumin. The problem was reviewed by the staff and everyone felt that intracranial and endocrine causes for hypertension had been ruled out. It was concluded that the hypertension was due to kidney disease, probably a chronic nephritis. Because of this, urine cultures were obtained and were sterile. Because the intravenous pyelograms were normal, unilateral disease of the kidneys was felt to be excluded. Examination for 17 ketosteroids in a twelve hour urine specimen was found to be normal. August 15, 1952, the child was discharged from the hospital.

The patient was readmitted to the Foundation Hospital on September 21, 1952, and recheck of his blood pressure was found to be in 195/110. His

urine still contained 4 plus albumin with low specific gravity. Chest x-ray was normal, but the electrocardiogram showed some changes for the worse since the previous one on the first admission had been normal. At this time the T waves were inverted in the first lead. Examination carried out under rectal pentothal anesthesia revealed a somewhat enlarged left kidney. The right kidney could not be palpated. A retrograde arteriogram was made by exposing the right femoral artery and introducing a cannula for the injection of diodrast through a catheter introduced into the aorta. Arteriograms outlined the renal arteries nicely. The left renal artery was normal. However, on the right side there were two renal arteries and both appeared dilated and tortuous, giving the appearance of aneurysms. Because of this finding, the patient was operated upon on September 26, 1952, and the right kidney was removed. On examination it was apparent that the renal vein was thrombosed and the two renal arteries were markedly sclerotic, dilated, tortuous, and showed aneurysmal dilatation. There was definite ischemia of about two thirds of the kidney with a rather distinct borderline between normal and ischemic portions of the kidney. The baby withstood the procedure quite well and had no complications. After the operation he had no polyuria and no increased thirst. The specific gravity rose to 1.018 and the urine was no longer positive for albumin. The optic discs which had been somewhat blurred previously became sharp. However, the retinal arteries remained tortuous. The blood pressure was 160/100 in the arms; however, when taken under rectal pentothal sedation, the blood pressure was 105/60. Discharged on October 6, 1952.

The patient was last seen at the Clinic in January 1953, at which time he was 14½ months old and weighed 26 pounds. He looked perfectly healthy. His blood pressure awake was 90/70 and under rectal pentothal anesthesia. Without anesthesia it was 107/70 in the right arm and 105/70 in the left arm. The eye grounds showed the optic discs to be flat, the vessels only slightly tortuous, but otherwise normal, except for a remnant of the macular scar on the right side. This scar had decreased in size. The blood count and urinalysis were normal. The urine specific gravity was 1.030. The blood urea nitrogen was 22 on one occasion and 14 on another. X-ray of the chest was clear. The size of the heart was a little smaller than preoperatively, measuring 7.8 cm. at this time. X-rays showed absence of the right kidney; however, the left kidney functioned well and was considered normal.

VASCULAR LESIONS

In those patients who have unilateral kidney disease and in which arteriography demonstrates that there is a vascular lesion in the renal artery artery itself or the major components of it, surgical therapy is likewise justified. However, according to Burns, in cases in which the vascular interference is apparently in the distal part, nephrectomy probably accomplishes little. Aberrant structures such as aberrant vessels may constrict the renal vessels and produce ischemia of the renal parenchyma which will cause hypertension. Simple correction of the constriction by division of the aberrant structure before irreparable kidney damage has resulted usually completely relieves the hypertension. Certain cases of hypertension caused by unilateral pyelonephritis can be relieved by nephrectomy The operation should not be done, however, unless the lesion is early and is definitely unilateral, unless the other kidney is normal, and the patient less than 50 years of age.

In the child with hypertension in whom it is found that the hypertension is limited to the upper extremities and is absent in the lower extremities, a diagnosis of coarctation of the aorta is justified. The diagnosis can be confirmed by aortography and the visualization of the constriction or stenosis. Because the life expectancy of an individual with a coarctation is definitely limited (only about 10 per cent of them live beyond 50 years of age) operative correction of coarctation is justified. Most of the adult types of coarctation which consist of a stenosis or short atresia can be cured by excision and primary suture of the aorta; even long atresias can be corrected by resection and replacement with homogenous aortic graft. Patients with coarctation treated by resection and suture or by resection and employment of homogenous aortic graft are perfectly well postoperatively in contradistinction to patients in whom many other anomalies of the large vessels and heart have been corrected.

The following is an example of correction of aortic coarctation:

B. L. W. age 20, white male, admitted to Ochsner Clinic on September 17, 1951, with the chief complaint of not being able to run or play like other children. Until the age of nine years, he had recurrent episodes of some type of seizure which caused him to "foam at the mouth" and chew

his tongue. He had not experienced these seizures since the age of nine. At the age of nine, his physician noticed that he had heart trouble, and at this time the boy first remembers having symptoms of shortness of breath upon exertion and a pounding in both sides of his neck. He played some baseball, but had to stop after a very short while. He does do rather strenuous work on the farm, but always notices the symptoms of shortness of breath and pounding in his head and neck. Three months before admission to the Clinic, he fainted shortly after drinking cool water. At the time he drank the water, he had just finished working in the hot sun. During the past three months, he has not fainted anymore; however, his shortness of breath has been worse. During this time, he has noted a greater inability to run and play than previously.

Physical examination revealed a blood pressure in the arms of 230/90; leg pressure was not obtainable. There were abnormally large pulsations and thrills in both anterior cervical regions. There was an aortic systolic murmur at the base of the heart transmitted to both sides of the neck. There was a questionable diastolic murmur in the third interspace and in the mitral area. The PMI was in the left sixth interspace in the midclavicular line. There were palpable arteries with murmurs in both subscapular regions. A presumptive diagnosis of coarctation of the aorta was made and the patient was admitted to Foundation Hospital on September 18, 1951, for retrograde aortogram. While in the hospital, a chest x-ray and cardiac fluoroscopy revealed cardiac enlargement predominantly of the left ventricle. There was some question of mild left auricular enlargement. The cardiac diameter measured 16.4 centimeters which was 40 per cent above the Ungerleider average of 11.7 centimeters. There was mild prominence of pulmonary vascular markings and some evidence of pleural thickening with minimal pulmonary congestion. There was a small aortic knob and rib notching was noted from the third to the ninth ribs posteriorly. Fluoroscopically there was some irregularity of the rhythm of the heart. The ascending portion of the aortic knob pulsated rather prominently. Retrograde aortograms made by injection of 70 per cent diodrast into the left common carotid artery revealed atresia of the aorta immediately distal to the left subclavian artery and tremendous development of collateral circulation in the left subclavian artery and its branches. Intercostal vessels were well demonstrated as was the left internal mammary and many other branches. The next films showed excellent filling of the descending segment of the aorta beyond the point of stenosis. There was slight dilatation of the poststenotic segment of the arch. No communication between the ascending and descending segments of the aorta was identified. It was concluded that there was either complete or nearly complete aortic stenosis just distal to the left subclavian artery and the stenotic segment was probably 2 centimeters in length.

The patient was discharged on September 21, 1951, from the hospital to await the obtaining of a satisfactory graft so that excision and grafting could be done. On January 13, 1952, the patient was readmitted to Foundation Hospital and it was noted that his general physical condition had deteriorated rather markedly since discharge. His symptoms were approximately the same, i.e., shortness of breath and extreme palpitation in the head and neck with slight exertion. The chest x-rays revealed the cardiac diameter to be 18 centimeters which was considerably larger than previously. Intravenous pyelograms revealed the kidney function to be good. The electrocardiogram originally showed sinus tachycardia with frequent auricular systoles, also multiple premature contractions and incomplete A-V block without dropped beats. There was extreme left axis deviation and multiple changes in the T-waves. This was considered to be typical of left ventricular strain and definite evidence of myocardial disease. The electrocardiogram taken on readmission and during his hospitalization failed to show any changes. The patient was dehydrated and digitalized. Laboratory examinations were all normal. On January 24, 1952, the patient was operated upon. The procedure was difficult because of the bleeding in the chest wall from large collaterals. The stenotic segment of the aorta was 37 millimeters in length and complete over a distance of 7 millimeters. The aortic arch appeared to be continuous with the subclavian artery. The entire stenotic segment was excised and a 61 milimeter long homogenous aortic graft was inserted. This graft was six weeks old and had been kept frozen. The patient withstood the procedure well and left the operating room in good condition.

Postoperatively, the patient generally did well; however, his cardiac status was precarious due to his preoperative condition of congestion, some cardiac failure and general debility. In the early postoperative period, fibrillation occurred but was controlled with quinidine. Two days postoperatively the blood pressure in the right arm was noted to be 150/60 and in the left arm 128/50. Pulsations were definitely present in both dorsalis pedis arteries. On the fifth postoperative day, the blood pressure in the right arm was 176/60 and in the left arm, 150/60, in the right leg 120/80 and in the left leg 110/85. Shortly before discharge on the fourteenth postoperative day, the blood pressure in the right arm was 178/75, left arm 150/75, right leg 138/78 and the left leg 140/80.

On February 7, 1952, the patient was discharged on quinidine and appeared in generally good health. He was walking and no shortness of breath was noted with this amount of exertion.

The patient was seen three months postopera-

tively and a chest x-ray made at that time showed no change in heart size, but there was diminution in the congestion in the lungs. Clinically, he was much improved, being able to walk one and one-half miles without dyspnea and no longer having pounding in the head and neck when walking. Pulses were irregular, the apical beat being 92 and the radial beat being 80. Blood pressure in the right arm was 150/50, in the left arm 150/50 and the dorsalis pedis pulsations were excellent in both feet. Clinically, the patient was considered to have an excellent result from the resection and grafting.

A telephone call to his local physician on February 28, 1953, which was approximately fourteen months postoperatively, revealed the patient to be in generally good condition. He was going to high school; whereas, preoperatively he had to quit school. He has had no syncope or headaches since surgery. There was very little shortness of breath and no evidence of pulmonary edema. His local physician said that the systolic pressure in the arms had risen slowly to approximately 185 systolic, but this had not affected the patient so far. He did continue to have an irregularity of the pulse and was on quinidine and digitalis. The peripheral pulsations were excellent.

CONCLUSION

In conclusion it must be emphasized that arterial hypertension is primarily a medical disease and most cases can be treated by conservative measures. However, there are many cases of secondary hypertension which are best treated and can be cured by surgical procedures. It is imperative, therefore, to evaluate each case of hypertension in order to determine whether the cause is correctable because complete cures can be obtained in most of such cases.

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PULMONARY DISEASE; DIAGNOSIS AND TREATMENT*

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NEW ORLEANS

Tuberculosis is still our primary pulmonary infection. Over the years there has been little added to aid in diagnosis. The x-ray remains the chief instrument in our armamentarium. Survey films by photofluorographic units have increased the number of cases found. However, I might mention that many pulmonary lesions are missed by conventional E.P.A. films. Lordotic, obliques, laterals and planigraphic views are not only helpful but at times are mandatory for diagnosis. There are newer cultural methods which may speed up the diagnosis.

In treatment, in the last few years, many new drugs and methods have come to the fore. Today, streptomycin and PAS (para-aminosalicylic acid) still lead the field. After seven to thirty days of streptomycin (1 gram daily) coupled with 12 grams of PAS daily, streptomycin is given twice weekly with PAS daily. Terramycin, aureomycin, neomycin and viomycin have all showed some antiproperties but none have approached the leader, "Strep. and PAS."

Tibione, even though having toxic properties, has been used when no results with the above have been forthcoming. This latter drug is most beneficial in fistulae and empyema. This brings us to the new wonder drug, isonicotinic acid hydrazide or INH. It is felt that INH should not be used alone because of the early loss of sensitivity, and also, it is not without toxic manifestations which may vary from increased reflexes to psychosis. Allergic reactions may be manifested by chills, fever, purpura, arthralgia, albuminuria and hepatitis. When used with streptomycin, PAS, or possibly one of the other antituberculosis drugs, synergism results and even though the organisms may become insensitive, spu-

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tum conversion may occur. The accepted dosage is 4 to 7 milligrams per kilogram of body weight.

It must be remembered that even though pneumoperitoneum has almost replaced pneumothorax in our armamentarium, there is still the case for which pneumothorax is the procedure of choice. Even though the pendulum has swung away from pneumothorax, it is my opinion that there will be a return to pneumothorax with better selection of cases coupled with antibiotic therapy.

It is timely to mention that cortisone causes an increased caseation and should be used only when absolutely needed and preferably covered with streptomycin after tuberculosis has been ruled out.

BRONCHIECTASIS

The chronic pulmonary condition is more and more being treated with antibiotics. The old diagnosed cases, not having had surgery, continue to have exacerbations. These have been treated with penicillin and after a change in the bacterial flora flared up with other organisms. Thus it seems that the offending organisms must all be controlled simultaneously and a combination of drugs used. Again it seems that if the patient is not sensitive to penicillin, a combination of penicillin and triple sulfas should be tried before streptomycin is used. Terramycin and chloromycetin also have been quite beneficial in controlling the infection when results were unattainable solely with supportive procedures, such as postural drainage, expectorant and bronchodilator drugs, and change of climate.

It is true that bronchiectasis is not seen today as it was twenty years ago, most of which is due to drug therapy of the pneumonias which usually caused death. Since the advent of antibiotic therapy, bronchiectasis per se does not cause death, but is still an entity which in the absence of tuberculous etiology can be adequately treated.

CARCINOMA

Primary carcinoma of the lung is fast becoming the leader in the carcinoma field. It has only been in the last fifteen years that the hopeless prognosis has begun to fade. We are chiefly concerned with the *early diagnosis*. This can only be accomplished by having a high suspicion index. The x-ray is the chief means of diagnosing this condition. However we are too prone to treat a painful shoulder as an arthritis for several months without resorting to careful history, physical examination, and x-ray. It has been shown that the average duration of time before diagnosis is four to five months. This delay is our fault in approximately 50 per cent of the cases. Another diagnostic aid is found in cytological techniques of preparing smears and blocks of sputum and bronchial washings. Naturally, bronchoscopy with biopsy is of extreme importance.

The important symptoms are: (1) cough, (2) hemoptysis, (3) development of asthma, (4) recurrent attacks of pneumonia, (5) pain.

Naturally, the treatment is surgical but we must embark on an over-all plan to educate not only the laity but also the profession. (1) X-ray surveys at six month intervals would surely increase the number of cases found. (2) More diligent history taking and physical examinations; (3) Better laboratory anud radiological examinations; (4) Develop a positive attitude and do away with watchful waiting.

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HEARING AND SPEECH IMPAIRMENT IN YOUNG CHILDREN

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Most of us are aware of the recent advances in the diagnosis and treatment of hearing loss in adults, but there has been comparatively little interest in the hearing and speech problems of young children, that is, those under six years of age. The general practitioner, the otolaryngologist, or the pediatrician are often the first to be consulted concerning a hearing or speech problem in a young child. Frequently the advice given is to wait for improvement.

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Were these children investigated thoroughly in the beginning, proper treatment could be instituted and further problems, such as speech deterioration and personality maladjustments, could be prevented from developing. It has been through the efforts of those working in the fields of clinical psychology, speech therapy, and audiology that progress is being made. We feel that the physician should no longer avoid this responsibility but should work hand in hand with those who have done so much to unearth basic information.

In most cases the presenting complaint has been one of lack of development of speech. One reason for our difficulty has been failure to realize that deafness is not the sole cause for a child not responding to sound. The training of a hearing impaired child differs greatly from that of the other children with speech retardation and consequently it is important to make the differentiation early. If we are to unearth some of the other causes for speech retardation, the total behavioral pattern of the child must be analyzed.

Another difficulty is to decide what method to use in testing hearing in young children. This is undoubtedly due to the fact that the average physician is not familiar with the tests that have been developed. Unfortunately, we have assumed that the same hearing tests used for adults can be used for children, but, as we have all learned from experience, pure tones are unsuitable stimuli for young children. Actually, the child does not respond consistently to pure tones because he is immature and they do not signify anything meaningful to him, such as does the sound of a bell or whistle. In other words, the child is no more mature perceptually than he is physically or emotionally.

Speech develops in a normal hearing child as a result of two forms of stimulation. First, the urge from within which finds expression in vocal form, and second, auditory stimulation from without, in the form of words which reach him through personal relationships. Both of these factors can be present for the deaf child. The first factor is natural, that is the urge from within, and the second, that of auditory stimulation from without, is up to the people in his home environment. In infancy, a deaf child's social relationship should not be different from the normal. All obvious wants can be satisfied because they relate to the body and are simple. As the child grows, however, gestures do not suffice as stimulation for the mind. The child must be able to hear and use language in order to be able to develop abstract concepts.

An extremely important fact that has not been realized until recently is that there is absolutely no difference between the vocalizations of the normal child and those of the child who is severely deafened, up until the age of 18 months.[3] In both, the vocal play is rhythmic and there are natural variations in loudness and pitch. They show trills of laughter, indignation, and emotion. Contentment is evidenced by quiet rhythmic tones, and urgent desire by louder and stridulent ones. These, we all know, are considered normal. However, after the age of 18 months, if the deaf child is left to himself, he tends to lose interest in using his voice and becomes more and more silent, unless he is disturbed emotionally. When he begins to use his voice less, he makes his wants known by pulling, pushing, and gesturing. Here at the age of 18 months the psychological and emotional breakdown of the child begins. If the natural pleasant tones of a deaf child are encouraged so that they are repeated day after day they become fixed in the child's mind through kinesthetic sensation. Finally, these pleasant sounds become automatic and serve as a natural basis for the development of speech.

Now let us return to the problem of testing the hearing of young children. If pure tone testing is not applicable, what then is the answer? In our opinion, the limitations of pure tones can best be overcome by the use of free field tests. Free field tests are those whereby the sounds are presented freely in the immediate area surrounding the child. This procedure is in contrast to that of presenting the sounds directly to the ear as is done in the formal audiometric

test. Sound makers such as bells, symbols, pitchpipes, and whistles are suitable for producing the sounds. The approximate frequency and intensity range of each sound maker can be determined. Readings can be taken at given distances from the ear and thus the intensity can be regulated. The response to sound by this type of testing is determined by a method called "cessation of activity."[9] Whenever possible, the child is engaged in an activity, such as rolling a ball. It is most effective to have the child engaged in this activity with the parent. Free field sounds at predetermined distances are introduced while the child is playing. Sounds of mild intensities are given first because some children respond better to faint sounds than they do to loud sounds. The child usually responds by momentarily interrupting the activity in which he is engaged. This type of cessation of activity response is useful with children as young as one year of age. However, the type of activity selected must be suitable for the age level of the particular child. It is obvious to all that this is a simple, inexpensive method of examination, one that can be utilized in any office with a minimum of fancy equipment. It does require much time and patience and does not lend itself to the rush of routine office hours. This method is flexible and can also be used with negativistic or hyperactive children.

There are many elaborate procedures that have been developed which are more objective than the one described here. Some of these other tests are: psychogalvanometry as advocated originally by the Hopkins[1, 5] group; electroencephalography as practiced by Marcus and Gibbs[6] in Chicago; and the peep show audiometry as originally suggested by Dix and Hallpike[2] and modified by others, such as Guilford and Haug[4] in Houston. All of these methods add to our armamentarium of diagnostic procedures but all have the limitation of the experience and ability of the operator and the expense and difficulty of administering the test.

We have previously mentioned that besides deafness, there are other causes for lack of response to sound. These conditions are aphasia, psychic or emotional deafness, and mental deficiency. To differentiate these conditions in early life, one must evaluate the child's total behavioral pattern. This pattern can only be discerned through a detailed history and careful clinical observation, in addition to a study of motor performance, mental capacity, and social maturity.

We do not propose that the physician become a proficient practicing clinical psychologist, sociologist, or psychiatrist, but if we are to make sensible suggestions to parents, we must acquaint ourselves with some of the outstanding characteristics of the emotionally disturbed, the aphasic, and mentally deficient child.

So that we may have a basis for comparison, we will first describe some of the characteristics of a child with a true hearing loss.[9, 10]

1. Speech development is retarded.
2. The voice has a characteristic tonal quality. The ear monitors tonal quality and the child speaks as he hears.
3. The child does not improvise sound for pleasure, but uses his voice for utilitarian purposes. For example, he does not sing to himself. He will make sounds, however, when he wants food and attention.
4. The child uses his voice projectively, that is, by means of his voice and sounds he projects himself into his environment to attract attention.
5. The deaf child uses gestures to make his wants known, that is, he assumes symbolic behavior which is a form of language.
6. A deaf child responds consistently to those sounds he can hear.
7. A deaf child is unusually sensitive to vibration, movement, and other visual cues.
8. The gait of the deaf child is often characteristic. The child may drag his heels because he doesn't hear himself walk.
9. A deaf child often makes a great deal

of noise during mastication because he cannot hear himself chew.

10. The deaf child has poor social rapport; there is much preoccupation with objects and things and little contact in a give and take manner with people.

Some of the characteristics of the child with psychic or emotional deafness are:

1. This child has a history which reveals that he has been considered primarily a behavior problem rather than a problem of hearing impairment.
2. Most have good vocal quality.
3. Frequently the parents give good evidence for hearing. They may make a statement such as "sometimes he seems to hear me." Often children will produce speech, such as "yes" or "no" under stress situations or when they are separated from their parents. We can thus conclude that they have been able to hear within normal limits.
4. Their laughter and gait are usually like those of a normal hearing child.
5. Often, paradoxically, they respond to what may be called pleasant sounds of low intensity but show no response to high intensities even though these may be expected to stimulate pain and fear.

Let us now consider the aphasic child.

1. The aphasic child is most inconsistent in his response to sound.
2. He does not gesture if he is a predominantly receptive type, because he lacks symbolic language.
3. He does not respond objectively with his hearing.
4. He does not respond well to vibrations, movements, or other visual cues.
5. Aphasic children are often attentional problems. They seem to be abnormally preoccupied with one activity.
6. The aphasic child can be trained or conditioned to respond to sounds which he has learned to interpret. For example, an aphasic child can be taught to respond to the noises of removing a cookie from a jar.
7. Psychological test results usually show wide discrepancies between verbal and performance levels. They may also reveal characteristic perceptual disturbances of the brain damaged.

Finally, the symptomatology presented by the mentally deficient child is:

1. He is deficient in curiosity, imagination, attention, and interest.
2. There is a generalized retardation in learning to care for himself.
3. The response to sound is erratic, especially if pure tones are used.
4. Subtle responses to normal speech sounds can often be elicited.
5. Vocalizations are made for pleasure and the quality is like that of children with normal hearing.
6. There are often other evidences of interference with physical development.
7. Mental tests, while not always conclusive, usually reveal marked retardation.

We have stressed the importance of diagnosing hearing impairments and speech retardation at as young an age as possible from the following aspects:

1. Advantages of early training.
2. Methods of hearing testing.
3. Characteristics of the hearing impaired child as compared with the emotionally disturbed, the aphasic, or the mentally retarded child.

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FUNCTIONAL HEADACHE*

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THE PROBLEM

In 1924, Graven[1] wrote, "One of the most baffling problems in medical therapeutics is that of dealing with the treatment of headaches. The main reason for this lies in the failure to detect the exact etiology of headaches, and, strange to say, the casual factor, the psychic, which should most obviously, because of its frequency, force itself upon medical practitioners, is the one most neglected."

ETIOLOGY

Alvarez[2] lists 26 types of headache, including one type, "unusual headaches," under which he gives 16 other causes of headache. Curry and Shnider[3] give the following diagnostic classification of headaches in a series from the diagnostic clinic of Georgetown University School of Medicine: psychoneuroses 38, migraine 21, postlumbar puncture 3, epileptic 2, hypertensive 2, unknown 2, and brain tumor 1. They feel that these are representative of headaches encountered in the ambulatory patient. Cabot,[4] in 1911, at Massachusetts General Hospital, in a series of 2246 cases, listed 46.2 per cent as psychoneurosis, while 23.1 per cent were of unknown origin.

Ogden[5] who has made an extensive statistical study which was arranged for IBM assortment and was checked for error by a statistician, reports an incidence of 68.4 per cent for all types of headache in a series of 4,634 adults. His studies indicate the following interesting points. Headache is directly proportional to degree of education and inversely proportional to age in years. It occurs more frequently in those whose occupations embody more tension, worry, and responbility. Elsewhere[6] he notes that only 18 per cent of headache sufferers seek aid specifically for that complaint. Incidence is higher for females in all of the groupings he used. Although worry ranks fifth as a suspected cause in all groups and emotions fourth in one group and eighth in the other three groups, the treatment was directed by a psychiatrist in only 0.1 or 0.2 per cent of the total headache cases.

Definition of functional headache is itself a point of dispute. The term should be limited to headaches in which no organic basis can be demonstrated, and, as Friedman et al[7] state, "should be limited to head pain occurring in relation to constant or periodic emotional conflicts, which may be conscious or unconscious." From this definition we feel that migraine and allergic headaches should be regarded as functional since careful study in most cases disclosed strong contributory psychic factors.

MECHANISMS OF PAIN

Wolff[8] has adequately described the pain-sensitive structure of the head, pointing out that traction, displacement, and distention of the tributary veins of the venous sinuses, large arteries at the base of the brain near the circle of Willis, cranial nerves and branches of the external carotid artery caused pain. Other experiments disclosed that prolonged contraction of the muscles of the neck and scalp produced pain.

DIAGNOSIS

After ruling out organic pathology, a complete and detailed psychiatric history is taken, with particular reference to presence of headaches in the family, exact description of the circumstances and nature of the original attack, changes in the type of headache and relationship between headaches and emotional stimulation. Drugs altering vasodynamics may be used diagnostically. On several occasions we have been able to reproduce the acute pain by forced hyperventilation. Relief of pain with small doses of 2 per cent solution of sodium pentothal intravenously (5 to 10 cubic centimeters) followed by verbalization of conflict at the hypnotic level of narcosis is a valuable procedure.

Thompson[9] describes two general types of

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functional headaches as presented by complaining patient. The first involves sensations of discomfort, pressure from within or without the head, constrictions and numbness of the scalp. The second involves real and severe pain, particularly in the frontal or occipital regions, which may radiate down the neck or over the head and there localize on one or both sides. Regarding the first type, Wolf[10] associates them with depressed and anxious patients and notes that they are accompanied by other physical signs of anxiety, are resistant to analgesic medication and may persist for weeks or months.

TREATMENT

Darnley[11] points out two phases in treatment, the first directed toward relief of the acute attack, the second, long term therapy aimed at prevention of attacks. This latter phase chiefly embodies psychotherapy. The first phase is usually accomplished with analgesic drugs, local application of heat and cold, and/or drugs altering vasodynamics or relieving muscle tension. Grenfell[12] compared the effectiveness of DHE-45,nicotinic acid and cafergot in tension headache. He found DHE-45 best, nicotinic next, and cafergot least effective in relieving the acute attack.

It was our observation that patients suffering from other neuropsychiatric problems frequently included headaches of recurrent or persistent type in the review of complaints by systems, and that the headache was relieved along with other symptoms by shock therapy. In these cases we felt that it was only proper to consider the headache as part of the original syndrome. On this basis, we could see no valid reason for not considering headache alone as the single manifestation of severe conflict, not infrequently incapacitating. Although we had excellent rules in many cases with the procedures outlined above, certain cases remained intractable. Usually these patients had consulted from two to fifteen physicians prior to being referred to the psychiatrist. This search for relief had accomplished two adverse results, destruction of faith in medical science and depletion of finances. To overcome the former would demand more prolonged psychotherapy than the latter would permit. We decided to employ shock therapy in such cases to accomplish the first phase of treatment.

Between 1949 and 1952, we treated 14 headache cases, all females, with electric shock treatment and sub-shock insulin. Their ages ranged from twenty-seven to forty-five years. Headaches had been present from one year to "life," occurring at intervals of from twice a month to constantly. In each case both hostility and guilt were established from the psychiatric history. All had had two or more of the usual procedures employed in the first phase of treatment without more than the most transitory improvement, headaches returning within a few days after treatment. They received from 3 to 6 ESTs and from 1 to 5 insulins. In 9 of these we obtained sustained freedom from headache, 3 were improved as to frequency and severity, 2 were unimproved. Six followed with psychotherapy and 5 of these have had only occasional mild headaches at widely spaced intervals.

From these 14 cases we can draw the following composite picture. The patient is a thirty-five year old white female, married, with two children. Her husband is employed by someone else. Her parents are living, are not congenial and her mother has been in poor health for years. Her father rigidly applied a standard of morality to his children. The parents have always been critical of others. Aside from resentment of parental restriction, her childhood was not remarkable. Her adolescent social adjustment and her dating were restrained and restricted, she was inhibited and frequently envious of other girls. She married at nineteen after finishing high school. Her parents disapproved of her marriage and made her feel that she had not discharged her responsibility to them. It took her five years to become sexually responsive to her husband. He became irritable, fault-findinf and a moderate user of alcohol. She turned to her family but found herself rejected in favor of more passive siblings. Her efforts to win their approval by doing

them favors and services were not rewarded, either by approval or reciprocation.

Headaches began seven years prior to being referred to the psychiatrist. At first they were in the neck, radiating to the frontal or temporal regions, appeared to be associated with menses, and were quickly relieved by aspirin or BC's. She become irritable with her children. The headaches gradually increased in frequency and severity, localized in the temporal region, sometimes unilaterally, sometimes bilaterally, were throbbing and pounding in character, lasted for several hours and responded poorly to analgesics and sedatives. Physical examination was noncontributory.

Her relationship with her husband and her neighbors deteriorated. She was no longer able to join in social activities, nor could she care for her home in the scrupulously clean manner that had previously been her habit. She began a round of physicians and underwent several forms of treatment without sustained relief. Histamine injections did give a month of relief but relapse followed. At this point she was taking several little white tablets a day and frequently had to take one or two red capsules at night. Occasionally, her physician would have to come to the house and give her a shot for relief. She was never entirely free from a little nagging headache. It did not exactly hurt, just felt uncomfortable. The bad ones occurred once or twice a week and sometimes lasted two or three days.

At this point she was referred to the neurosurgeon, who found no organic pathology and referred her to the psychiatrist. She was resistant and her husband was both broke and disgusted.

Such a patient presents a severe therapeutic problem. Usual methods may signally fail and in such cases we believe shock therapy is indicated. Our procedure is to give EST on the first two days, then alternate with sub-shock insulin until relief is obtained. We have had to use no more than six ESTs in our cases. The usual period of hospitalization has been ten days.

CASE REPORT

Case No. 1: A thirty-seven year old female, married, three children, admitted September 5, 1950, with complaint of vertigo and headache. History of sudden onset with vertigo, unsteadiness, headache, nausea and vomiting two months prior to admission. This last had been continuous with acute exacerbations characterized by sharp, stabbing pains in the right ear and diplopia at the height of attacks.

Past history disclosed she was the child of rigid parents whose perfectionism she could never gratify. She led her class in high school and was in the upper fifth in college. She married at twenty-five and has had seven pregnancies with four miscarriages. About five years before the present acute episode, following a miscarriage, she underwent a series of cyclic swings of mood. Since then she had had periodic migraine-like headaches and postmenstrual tension headaches, for which she had been treated with vasoconstrictors and vasodilators. In 1942, she had a supravaginal hysterectomy. She has demanded perfection in her children.

The family history revealed no contributory data except diabetes in the father.

Physical and neurological examinations were normal except for blood pressure of 82/64 and slight right horizontal nystagmus. Laboratory studies, including spinal fluid were within normal limits. Skull x-rays were negative. EEN&T and neurological consultations did not contribute positive findings.

She was treated with nicotinic acid, dramamine, and intravenous histamine with improvement. On September 10, 1950, she was discharged with diagnosis, headaches of undetermined origin.

She was readmitted September 28, 1950, with headache, ataxia and vertigo, and with further complaints of nervousness, agitation, and depression. Ventriculography showed good filling of the ventricular system without abnormal shifts or dilation. Spinal fluid continued normal. Psychiatric consultation revealed anxiety and conversion signs, while under pentothal synthesis she expressed marked hostility toward her father because of his extreme rigidity in rearing her and because he never accepted anything she did as satisfactory. She appeared to identify her husband with her father and felt that she was failing to please her husband and was unsuccessful as a mother. She was discharged on October 10, 1950, as unimproved.

On October 24, 1950, she was readmitted with provisional diagnosis of vascular headache. There was no change in physical or laboratory findings. BMR was plus 3. She was given four ESTs and three light insulin reactions. Her headache disappeared after the third EST, while depression which had been present on readmission disappeared on the fifth day of treatment following the second insulin reaction. She was pleasant, relaxed, and fully coordinated when discharged as improved on November 1, 1950.

Psychotherapy at weekly intervals was instituted on her discharge. There was no return of symptoms until she visited her father's home in January, 1951. On January 16, 1951, she was readmitted with mild vertigo and slight headache. She was apprehensive lest she have a full return of symptoms and was discharged January 19, 1951, as improved.

Psychotherapy was continued for another two months and discontinued. In March 1953, she reported that she had had no further symptoms.

SUMMARY

1. Functional headaches have been considered from the standpoints of etiology, mechanisms of pain, diagnosis, and treatment.

2. Two phases of treatment have been emphasized, relief of the acute attack and prophylaxis against recurrence.

3. The use of shock therapy, both EST and sub-shock insulin, has been suggested in certain intractable cases to effect the first phase.

4. Results in 14 cases have been summarized and a composite picture of the headache case drawn.

5. A case illustrating the use of shock therapy for the first phase and psychotherapy for the second has been presented.

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CARE OF VETERANS WITH NON-SERVICE-CONNECTED DISABILITIES BY THE VETERANS ADMINISTRATION

The problem of the care of veterans with nonservice-connected disabilities by the Veterans Administration has been before Congress at various times. It was considered briefly in the latter part of the last session of Congress and will, no doubt, be considered again in the second session of the present or 83rd Congress. The implications of any plan that may be arrived at are going to be far reaching.

As the law stands at present the Veterans Administration takes care of veterans with service-connected disabilities. It also takes care of veterans with nonservice-connected disabilities when facilities are available, and when the veteran signs an affidavit stating that he is unable to pay for needed care. On the one hand, this affidavit and the statements made in it are never investigated. On the other hand, there has been expansion of facilities and pressure for even further expansion, presumably to take care of any veterans who might apply.

In the closing days of the first session of the present Congress, discussion of certain phases of this problem became heated. The house instructed its Veterans Affairs Committee to go into the matter and report back. Two weeks of hearings ensued which were concluded on July 21. Before this Committee, opposing views were given by the several parties concerned. The positions taken were approximately as follows: Veterans organizations, with one notable exception, (AMVETS) maintained that nonservice connected medical care in VA hospitals is a right of all indigent veterans and that the VA should not have to investigate the ability to pay affidavits. The American Dental Association, supported by AMVETS, considered that the theory of the service-connected tooth was scientifically unsound. They said that the practice of caring for this type of dental problem "goes beyond the obligation of the government to the veteran." The American Medical Association, the National Medical Veterans Society, the American Hospital Association, and similar groups considered that there should be a law stated in unequivocal language which would rule out nonservice-connected medical care in veterans' hospitals, except for long-time tuberculosis and neuropsychiatric cases. The two latter types of cases were to be cared for within the limits of existing facilities. The stand taken by the American Medical Association was in accordance with the findings of a special committee set up to study the problem in December 1951, and in accordance with the action of the House of Dele-

gates, in June 1953. The statement supporting this position was presented by Dr. Walter B. Martin, president-elect, and member of the Board of Trustees of the American Medical Association. He made it clear that as a veteran and as a physician he was fully appreciative of the contribution made by men in uniform to their country. He was equally appreciative of the problems, medical and otherwise, which arise during and as a result of their service. He stated with respect to the care of veterans with service-connected disabilities that the American Medical Association is, and always has been, in complete accord with the overwhelming sentiment of the American people that the federal government has a duty to care for any man who has become physically and mentally handicapped as the result of miltary service, but in regard to nonservice-connected disabilities the position is different.

Since 1924, on more than thirty occasions, the House of Delegates and Board of Trustees of the AMA have considered various aspects of this problem. It was pointed out to the Committee that, although much discussion had been devoted to the validity of reported statistics and to the efficiency of the Veterans Administration in the operation of the medical program, it was the belief of the American Medical Association that the really basic questions involved have been ignored. Dr. Martin stated that the problem called for more definite legislation, if we are "to reorient our thinking and to recognize the dangers which threaten the foundations of our basic philosophy before we reach the point of no return in terms of collective socialistic planning." It was felt that Congress should itself decide several questions: First, whether existing legislation providing hospitalization and medical care for veterans with nonservice-connected disabilities is sound. Second, whether the federal government should continue to engage in a large scale medical care program in competition with state, local, and private medical institutions. Third, whether the ever increasing cost of such a program is a proper burden to impose upon the taxpayers of this country.

The feeling of the AMA was that Veteran Administration hospitals should discontinue the care of nonservice-connected disabilities, and that the responsibility for such care should revert to the individual, or in the case of indigent veterans, to the community. The exception to this recommendation was that tuberculosis and neuropsychiatric disorders, within the limits of existing facilities, be cared for by the Veterans Administration, for the reason that at the present time this is believed to be necessary because of the inadequacy of local facilities designed to provide treatment for all such cases. It was pointed out that the burden of providing such care for nonservice-connected disabilities involved great expense and great expansion of the present physical facilities. At present, there are approximately 20,000,000 veterans with an annual increase of approximately 1,000,000. Of this total, 15,000,000 are veterans of World War II whose average age is about thirty-three. The Veterans Administration anticipates that at the turn of the century there will be 3,404,000 World War II veterans alive with an average age of about seventy-eight. With the number of veterans increasing yearly and their disabilities increasing in proportion, it is clear what the tax burden would be. If political jockeying would contrive a change in the law by which the responsibility of the Veterans Administration would apply to veterans and their family, State Medicine will have been established by the simple process of infiltration.

It was pointed out by Dr. Martin in the hearing that in 1940, there was no talk of a shortage of physicians. In 1952, when the population of the country had increased by 20 per cent, the physician population had increased by 28 per cent to a total of 216,200 physicians. At this time, there is much concern about a shortage of physicians. The apparent shortage of physicians results from the federal government maintaining five major medical training activities for internes and residents. These are the Vet-

erans Administration, the Army, the Navy, the Air Force, and the United States Public Health Service. These medical services have gradually expanded their activities by drawing into their sphere a constantly increasing number of civilians who previously were cared for by private civilian medicine. Formerly, these services relied upon civilian training programs to provide skilled specialists; they now have embarked upon training programs of their own. In order to provide this, it is necessary for service hospitals to provide diversified clinical material. As a consequence, there has been increasing pressure to draw into these hospitals nonservice-connected general medical and surgical cases from among the veteran population, as well as dependents of service personnel. Veterans hospitals are thus in competition with civilian hospitals, not only for staff personnel but for patients.

In consideration of all these facts, the position of the spokesman of the AMA summarizes the feeling of organized medicine throughout the nation: The Veterans Administration should care for the veterans' needs for which it was set up, and the veterans and other government service medical facilities should not compete with civilian hospitals and with civilian medicine.

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ORGANIZATION SECTION

The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

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Under these circumstances, it is difficult to imagine any eligible member who wouldn't grasp the opportunity to enroll for all he can get of this superior protection as the foundation of his program of economic security.

Carry as many additional policies as you wish, but don't pass up this *real value*. You can count on this protection when you need it.

The matter of guaranteed continuous protection under an Accident and Health Income policy is of great importance to members of our profession. Many of our members have relied solely on individual policies for their income protection only to find some years later that the Insurance Company will not renew the coverage. When that happens it is usually impossible for the member to buy insurance from another company because of his age or physical impairment. Consequently, the member has no protection just when he needs it most.

The best guarantee of continuous protection is given under our Group Plan. So long as this Plan exists, no individual member's coverage can be discontinued by the company before he retires or reaches age 70. This feature is far more important to the insured than a promise to pay long-term indemnities subject to restrictions that make it almost impossible to collect and subject to discontinuance at the company's pleasure.

It is important that all of our members fully understand these unusually fine features of our Group Plan because the better they understand it, the more enrollments there will be and the more who enroll in this Plan, the stronger and more beneficial the Plan will become.

It will be too late to get this protection after the enrollment period is closed and that will be real soon. If you don't make application at an early date you will, not only lose this splendid protection for yourself, but will defeat the whole program which will be most beneficial to all our members but especially will it be a terrible loss to many of our members who cannot get this unusual insurance protection at any cost other than through our group plan offered you at this time. Don't just read this and forget it but get any policies you might already have out and compare them with what our group policy offers. I dare say, if you do this, you will enroll immediately with the Continental Casualty Company of Chicago — a large nationally known company of unlimited experience and funds, which company is now giving us our last chance to secure this superior non-cancellable policy without examination and disregarding your present physical status and at a lower cost, than you can secure under any other circumstances.

Why not enroll today and secure this wonderful protection before it is too late? Help our organization to complete this enrollment, thereby giving you and our members this most needed protection.

If the members don't enroll very soon it will be too late and they will lose a wonderful opportunity to secure this policy with unsurpassed benefits.

If you don't get this protection don't blame us—just reverse the kick.

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RETIREMENT IS PART OF A CAREER

In the June, 1953 BULLETIN of the San Diego County Medical Society, Lucius W. Johnson, M. D., retired Navy Medical Officer, and an honorary member of the San Diego County Medical Society, gives his prescription for a successful retirement.

"In the Bible is a maxim: he who has put his hand to the plow cannot turn back. People who engage actively in useful work for years cannot stop all at once and expect to remain well and happy. Retirement is not the end of a career. It is an integral part of it, and as such it must be anticipated. Mind, body, and hands must be kept busy. No matter what your age, start now to prepare for retirement.

"Age causes more wrinkles in the mind than in the face, according to Montaigne, and many times the mind shows evidences of deterioration before the body. He is old who is no longer able to discover anything good in the ideas and opinions of the day. An attitude of obstinacy and belligerent criticism is part of this shriveling-up process. This attitude usually means that creative imagination is fading and that the field of interest is narrowing. Eventually, all thought is concentrated on one's self, and then a man has really achieved grade-A senility.

"It has been said that, while life begins at forty, so do fallen arches, bad eyesight, lumbago, and the tendency to tell a story three times to the same person. While we can hardly escape the physical ills, we can do a great deal to escape the mental ills because the mental ills of old age are caused directly by inactivity. One of my professors used to say that the way to keep any part of the body in good health was to exercise it every day to the limit of its capacity. This he insisted, applied to the brain no less than to the viscera and the muscles. Therefore, it is important to have at least one hobby that involves mental activity. If

it is creative, so much the better. Then you will add pride of achievement to joy of work.

"So here is my prescription for happiness in retirement:

1. Choose a suitable type of exercise, something you can do with people your own age.
2. Learn a hobby that will keep your brain and your hands busy.
3. Work with an organization that helps those less fortunate than yourself.

The most unpleasant way for a busy person to court death is to stop working."

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WARNS AGAINST FEDERAL "MEDICAL SUPERMARKETS"

DENVER—"A chain of federally-operated medical supermarkets," detrimental to the health and economy of the entire nation, is still in the making, Dr. Edward J. McCormick, president of the American Medical Association, said here Friday night.

Speaking before the Rocky Mountain Radiological Society's midsummer conference, the Toledo (O.), surgeon called for a halt in the expansion of federal medical care for veterans with non-service-connected disabilities.

"Continued progress in medicine, as in any other field of free enterprise, is best achieved without interference from a highly centralized government authority," Dr. McCormick told the group.

"There still is a determined effort on the part of some special interest groups to foist upon the American people a national health program that would ultimately evolve into a chain of federally-operated medical supermarkets.

"Preferential treatment for veterans with non-service-connected disabilities cannot be continued indefinitely in view of the detrimental effect on the health and economy of the entire nation."

Dr. McCormick stressed that the American Medical Association does not seek to eliminate the well deserved, free medical care for veterans with service-connected disabilities.

"On the contrary," he said, "it seeks to improve the quality, availability and efficiency of such care by taking out of VA hospitals large numbers of patients whose disabilities would have developed even if they had not seen one single hour of military service."

He said that veterans' medical care and hospitalization benefits should be limited to: (1) veterans with peace-time or war-time service, whose disabilities or diseases are service-incurred or aggravated, and (2) within the limits of existing facilities, to veterans with war-time service suffering from tuberculosis or psychiatric or neurological disorders of non-service-connected origin who are unable to defray the expenses of necessary hospitalization.

The provision of medical care and hospitalization in Veterans Administration hospitals for the remaining groups of veterans with non-service-connected disabilities should be discontinued and the responsibility for the care of such veterans should revert to the individual and to the community, he added.

Explaining that he did not believe everyone seeking to bring about federal subsidization of medical care is purposely working against the best interest of the people, Dr. McCormick said:

"There are many zealots among them who sincerely believe in what they are doing. Their greatest fault is that they are woefully ignorant of basic medical economics. And some, such as leaders of certain veterans' organizations, are unwittingly planting the seeds of socialization when they continue to foster the expansion of free medical care for veterans regardless of need and service connection.

"Some leaders of veterans' groups claim preferential status for all veterans. In a democratic nation we cannot have two types of citizenship. To serve one's country is a duty and an honor, and the only claim which any of us have as basic right is that principle for which we fought—individual freedom and dignity. We did not follow the colors to become wards of the government."

Dr. McCormick pointed out that there are about 20,000,000 veterans in this coun-

try, and that the number is increasing at a rate of 1,000,000 annually. He cited government figures showing that of the 511,895 patients who were discharged from VA hospitals during the fiscal year of 1951, 432,995 (84.6 per cent) were treated for non-service-connected disabilities, and only 78,900 for service-connected ailments.

In 1951, Veterans Administration medical expenditures totaled $600,388,455. Of this amount $461,695,848 was expended on the VA hospital program.

"As of July 31, 1952, the Veterans Administration had in operation 154 hospitals with 116,986 beds," Dr. McCormick told the meeting. "Under construction were 22 hospitals, including additions which would provide an additional 13,231 beds. In the planing stage were six hospitals and 5,000 beds. This would bring the total of VA hospitals to 182, with 135,217 beds."

APPOINTMENT

Dr. J. Kelly Stone, New Orleans, has been appointed a member of the Council of the Southern Medical Association from Louisiana for a regular Council term of five years, beginning at the close of the annual meeting in Atlanta, Georgia, in late October, the appointment having been announced recently by the President-Elect, Dr. Alphonse McMahon, St. Louis, Missouri. Dr. Stone succeeds Dr. Edwin H. Lawson, New Orelans, whose term will expire with the close of the Atlanta meeting and who having served the constitutional limit is not eligible for reappointment.

We congratulate Dr. Lawson on a job well done and Dr. Stone on his appointment and we are sure he will fill this position in a manner which will do honor to our profession.

LOUISIANA STATE MEDICAL SOCIETY NEWS

CALENDAR

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Tuesday of every month	Baton Rouge
Morehouse	Third Thursday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

G. P.'s SPONSORING POST-GRADUATE TRAINING

The Orleans Chapter (1st District) of the Louisiana Academy of General Practice is once again sponsoring a post graduate course for the enlightenment of its members and other interested physicians. A symposium on the Gastro-Intestinal Tract will consist of 6 lectures, will be presented and each being two hours in length. Lectures are on October 15, 22, 29 and November 5, 12 and 19 at 8:00 P. M., in Hutchinson Memorial Auditorium.

This symposium has been accepted as formal post graduate training by the American Academy of General Practice. Each member of the Academy in order to maintain his standing, must complete one hundred fifty hours of post-graduate training every three years. Of this one hundred fifty hours, fifty must be formal post-graduate work and the remaining hundred hours made up of attendance at hospital staff meetings, local medical society meetings and conventions, etc. Any member who fails to meet these obligations is dropped from the Academy. These requirements are part of the policy of the American Academy of General Practice in encouraging continued education of its members and thereby improving the standards of the general practitioner.

All members of the Orleans Parish and Louisiana State Medical Societies are invited to attend. The registration fee is $15.00. Interested parties may register by writing to Dr. E. A. Fatter, 822 Maison Blanche Bldg.

NEW ORLEANS OFFICERS ATTEND MEDICAL FIELD SERVICE SCHOOL

Twelve officers from the New Orleans area are at Medical Field Service School, located at Brooke Army Medical Center, Fort Sam Houston, Texas,

to attend a four-weeks orientation course in military medical service. The class is made up of officers recently called to duty in the Medical Service Corps, they are:

Major Paul T. DeCamp, 2609 Nasville Ave., New Orleans.

Captain Ian M. Thompson, 4317 Banks St., New Orleans.

Captain Antonio Miranda, 310 Sena Drive, New Orleans.

Captain Arthur C. Johnson, 2516 Gentilly Blvd., New Orleans.

Captain James L. Lenoir, 103 Forest Ave., New Orleans.

1st Lt. John B. Bobear, Charity Hospital, New Orleans.

1st Lt. Samuel M. Peacock, 1237 Jackson Ave., New Orleans.

1st Lt. Donald R. McCurley, 8330 Spruce St., New Orleans.

1st Lt. Everette F. Kreider, 4328 Paris Ave., New Orleans.

1st Lt. Warren J. Wonka, 1565 Owens Blvd., New Orleans.

1st Lt. Ernest B. White, Garyville, La.

1st Lt. Gaylord S. Knox, 3278 De Saix Blvd., New Orleans.

The orientation course stresses medical service in war. Subjects include clinical procedures in war injury, essentials of treatment for combat exhaustion, and preventive medicine measures detecting health hazards and avoiding epidemics.

Medical Field Service School is the world's largest military medical school directing resident and extension training for officers and enlisted personnel of the Armed Forces. Graduates are qualified for professional and technical duty assignments at military hospitals and medical field units located at stateside and overseas stations.

NEW BLUE CROSS SERVICE

It has been announced that Blue Cross Medical Care Plan is now available and offered to Blue Cross Plan Subscribers who are patients at the De Paul Sanitarium on a flat rate of $6.00 and $8.00 per day. This is a flat rate coverage and does not include X-rays, laboratory or any other adjunct.

RADIOLOGISTS REORGANIZE SOCIETY

At the 73rd Annual Meeting of the Louisiana State Medical Society held in May 1953, the Radiologists of Louisiana met and re-organized their association. The name was changed to the Radiological Society of Louisiana from the Louisiana Radiological Society.

The Officers of the Association are as follows: Henry M. Duhe, M. D., President, New Orleans. G. M. Riley, M. D., Vice-president, Shreveport. J. T. Brierre, M. D., Secretary-Treasurer, New Orleans.

THE NEW ORLEANS ACADEMY OF OPTHALMOLOGY

The winter convention of the New Orleans Academy of Ophthalmology will be held during the first week of February 1954. The subject of the symposium will be "Bacteriology and Infectious Diseases."

SOUTHERN MEDICAL ASSOCIATION TO MEET IN ATLANTA

The forty-seventh annual meeting of the Southern Medical Association will meet in Atlanta, October 26-29. Program plans are being completed by the officers of the twenty-one sections which compose the Association. Noted authorities will present papers dealing with the latest research and discoveries in all fields of medicine. The forty-seven half-day section sessions, the general session, conjoint meetings and exhibits will make this meeting one of the most complete general medical meetings of the year.

SECOND INTERNATIONAL CONGRESS OF CARDIOLOGY

The Second International Congress of Cardiology will be held in Washington, D. C., September 12-15, 1954. It will be immediately followed by the Annual Scientific Sessions of the American Heart Association, September 16-18, 1954. The opening session will be held in the auditorium of Constitution Hall at 10:30 a. m. on Sunday, September 12, 1954, with address of welcome. A reception will be given at the Mayflower Hotel at 5:00 p. m. on the same day for all Members of the Congress and their families. A banquet will be held September 15, 1954 at 7:30 p. m.

The Scientific Sessions lasting for three days will include formal papers, panel discussions, clinical pathological conferences and visits to important medical centers in Washington and Bethesda. The program will be printed in French, Spanish and English. Immediate translation of some of the papers and discussions will be made in three languages.

A series of Post-Congressional visits and conferences to at least 20 of the leading cardiac clinics in different parts of the U. S. and Canada has been arranged by special committees of local Heart Associations in the various cities.

The office of the Congress is 44 East 23rd Street, New York 10, N. Y., and the Secretary-General is L. W. Gorham, M.D.

INTERNATIONAL COLLEGE OF SURGEONS TO MEET IN NEW YORK IN SEPTEMBER

The Eighteenth Annual Congress of the United States and Canadian Sections of the International College of Surgeons will open at the Waldorf-Astoria in New York on Sunday evening, September 13, with a session open to the public on the "International Surgeons' Hall of Fame" with Dr.

Richard H. Shryock, Director of the Institute of the History of Medicine of Johns Hopkins University, Baltimore, speaking on "Fame in Surgery." The scientific program will open on Monday morning, September 14, with a session on "Advances in the Treatment of Cancer," with Doctors Charles S. Cameron of the American Cancer Society, Cornelius P. Rhoads of the Sloan-Kettering Institute for Cancer Research, George N. Papanicolaou of Cornell University Medical College, T. A. Watson of Cancer Services for Saskatchewan, Komei Nakayama of Chiba (Japan) University Medical School, and George J. Papayannopoulos of Athens, Greece, among the speakers. Themes for the other general assemblies will include "Teamwork in Rehabilitation"; "Advances in the Treatment of Cardiopulmonary Diseases"; "Advances in Thyroid Surgery"; "Surgical Treatment of Intervertebral Disc Lesions"; "Advances in Surgery of the Stomach and Intestines"; "Advances in Surgical Treatment of Diseases of the Esophagus"; and "Advances in Vascular Surgery."

MINERAL OIL AND VITAMIN A

The possible effect of the ingestion of mineral oil in removing the necessary amount of vitamin A from the food has been a source of comment and concern in recent years. An article recently (Steigmann, Popper, Dyniewicz, and Maxwell: Gastroenterology 20:587, 1952) reports a four year clinical research study on this problem.

It is concluded that no vitamin deficiency is traceable to the regular use of mineral oil as a laxative when the dosage is normal and the diet contins the normal vitamin A level. It was found that when the mineral oil was mixed with the meal in food that there was a slight drop in vitamin A, but when two tablespoons of mineral oil were taken at night, there was no drop in the vitamin A level.

SOUTHERN TUBERCULOSIS CONFERENCE

The Southern Tuberculosis Conference representing fifteen southern states and the District of Columbia will meet jointly with the Southern Trudeau Society on October 1-3 at the Jung Hotel, New Orleans.

BOOK REVIEWS

Technical Methods for the Technician; by Anson Lee Brown, M.D. 4th ed., Columbus, Ohio, Anson L. Brown, Inc., 1950-1951. pp. 784, illus. Price $10.00.

This is a laboratory manual devoted to all phases of clinical pathology. It contains basic features such as the use of an analytical balance and the microscope as well as unusual and difficult procedures such as the hyaluronidase assay of seminal fluid. All techniques are given in great detail step by step. Many illustrations are given with many in color. This is an excellent textbook for the technician who is interested in having readily available all laboratory procedures in one volume.

PHILIP PIZZOLATO, M.D.

Causalgia; by Frank H. Mayfield, M.D. Springfield, Ill. Charles C Thomas, Publisher, 1951. Pp. 54 Illus. Price $2.25.

This brief monograph in the American Lecture Series, of fifty-four pages with forty-three references, an index, and twelve figures, is based upon the author's own experience in military and civilian practice and supported by critical review of the medical literature on the subject, and tells about all that anyone need know, or at least all that is now available to be known, about this rare syndrome. The history of the syndrome is reviewed from the time of Weir Mitchell to include the best published lessons that came out of World War II experience.

The author believes that his observations support the hypothesis advanced independently by Granit, Leksell, and Skoglund, and by Doupe, Cullen, and Chance. This hypothesis is that a shunt may occur in a mixed nerve which in causalgia would be at the point of injury of such a nerve, so that impulses travelling outward from the central nervous system, in motor and autonomic fibers, may be shunted into sensory fibers and returned to the sensory centers in the brain, and there perceived as pain. This hypothesis is of great theoretical interest, and in the case of causalgia has revolutionized understanding and management. Physicians have long been impressed by the important relationship between the exaggerated emotional reaction and pain in causalgia. In the light of the new hypothesis, a mechanism is presented for that relationship in that autonomic impulses travelling outward from the central nervous system are a regular manifestation of emotional reaction and may lead directly to the initiation of pain, if a shunt exists in a mixed nerve. Because pain leads to exaggerated emotional reaction, and in causalgia exaggerated emotional reaction leads to pain, a vicious cycle is established. Interruption of the pain pathway by sympathetic block or, in the opinion of Mayfield, better by sympathectomy, has repeatedly led to a transformation of emotional status of the individual.

Details of the clinical picture observed in a large series of military cases are presented in tables and detailed instructions for treatment are described. This monograph is highly recommended.

R. H. TURNER, M.D.

Hypertension; A Manual for Patients with High Blood Pressure; by Irvine H. Page, M.D. Rev. 6th printing. Springfield, Illinois, Charles C Thomas, Publisher, 1951. pp. 90. Price $3.00.

This concise manual presents facts about hypertension in an authoritative and reassuring manner. The nature and purpose of the various aspects of the physical examination are discussed. The nature of the disease and its effects are presented in a factual but unfrightening manner. The discussion on the various forms of therapy and the desirability of developing a way of life is especially to be recommended.

This manual contains much factual information and suggestions which should help a hypertensive patient to understand the disease and to help him to cooperate in its control. It is highly recommended for hypertensive patients.

CLARENCE THORPE RAY, M.D.

The Treatment of Injuries to the Nervous System; by Donald Munro, M.D. Philadelphia, W. B. Saunders Company, 1952. Pp. 284, 47 figures. Price $7.50.

This volume is essentially a review of the personal attitudes of a leader in the field of the treatment of injuries to the nervous system. As such it may be of interest to neurosurgeons and others concerned with this form of practice. In the reviewer's opinion, however, it is not so organized as to be of value to anyone other than the few who wish to learn more of a fellow expert's opinions and prejudices.

DAVID A. FREEMAN, M.D.

Fundamentals of Psychiatry; by Edward A. Strecker, M.D., 5th ed. Philadelphia, J. B. Lippincott Co., 1952. Pp. 237, illus. Price $4.50.

In the preface the author states that this edition is addressed particularly to general practitioners and workers in every area of medicine and surgery. It is to this group, rather than to the experienced psychiatrist, that the book will appeal: it is brief, written with clarity and presents an eclectic summary of present day psychiatric theory and practice with little speculative or controversial material. That the book has served its purpose well is attested by the fact that it is currently in its fifth edition.

Besides well presented material on classification, diagnosis, and methods of examination, there are illustrative diagrams which the author has found valuable in his classroom teaching and a glossary of frequently used psychiatric terms.

In the chapter on "Treatment Including Psychotherapy" the author stresses the fact that the psychiatrist must first of all be a physician. There is a conservative but fair appraisal of the drastic therapies (insulin coma, electric shock, and leukotomy) and a discussion of the various types of psychotherapy with suggestions as to technique and applicability. In the reviewer's opinion the practice of psychotherapy is still far more of an art than a science and the most lucidly written descriptions and conceptualizations can never reproduce the subtle emotional coloring and "aliveness" of the material as it comes from the patient in the interview. A text book, like a cook book, is essential for the student—it lists the necessary ingredients and gives recipes—but the skill of the therapist like the skill of the chef comes only with long practice of the art.

Dr. Strecker's book offers a concise exposition of the importance of mental and emotional illnesses in medical practice and can be recommended highly to the beginner in psychiatry or to the interested medical practitioner. It deserves a place in every medical library.

HENRY H. W. MILES, M.D.

Radiologic Diagnosis of the Lower Urinary Tract; by D. E. Beard, M.D.; W. D. Goodyear, M.D. and M. S. Weeks, M.D. Springfield, Ill., Charles C Thomas, Publisher. 1952. Pp. 143. Price $6.50.

This condensed volume is an atlas of roentgenological diagnosis of a normal urethra and bladder and the pathological changes incurred in these and associated organs. The text includes a short summary of the anatomy and essential points of the etiology and pathology of the various diseases found in the lower urinary tract.

The book is practical and the material well organized. The technique described is simple and easily understood. The illustrations are clear and serve as excellent guides to one not familiar with these types of roentgenograms.

Although representative films are made of the various pathologic conditions it is felt that urethrograms are not indicated in all of them.

It is understood that although radiologic diagnosis of the lower urinary tract is a valuable asset it should still be considered only as an aid in our diagnostic armamentarium.

This book should stimulate interest in urethrograms and will serve as a practical guide and reference. It will appeal to urologists, radiologists, students, and some general practitioners.

JOHN G. MENVILLE, M.D.

PUBLICATIONS RECEIVED

Charles C. Thomas, Publisher, Springfield, Ill.: Atlas of Regional Dermatology, by Ernest K. Stratton, P.D., M.D., Harry L. Arnold, Jr., M.D., Maurice J. Costello, M.D., Lewis A. Koplik, M.D., and Paul Fasal, M.D.

The Williams & Wilkins Co., Baltimore: May's Manual of Diseases of the Eye, edited by Charles A. Perera, M.D., (21st Edit.).